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WHO CHRONICLE

VOL. 13, No. 6 - JUNE 1959

Protein malnutrition in South India
Anicteric virus hepatitis
The treatment of gonorrhoea
Accidents in childhood
Statistics and cancer
Respiratory virus diseases
Mental health in old age
Biological standardization

WORLD HEALTH ORGANIZATION
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The World Health Organization (WHO) is one of the specialized agencies of the United Nations. Through this organization, which came into being in 1948, the public health and medical professions of more than 80 countries exchange their knowledge and experience, and collaborate in an effort to achieve the highest possible level of health throughout the world. WHO is not concerned with problems which individual countries or territories can solve with their own resources. It deals, rather, with problems which can only be satisfactorily solved through the co-operation of all, or certain groups of, countries—the eradication of diseases such as malaria, the control of cholera, plague, yellow fever, smallpox and rickettsiosis. Progress towards better health throughout the world also demands international co-operation in many other activities : for example, setting up standards for biological substances, for insecticides and insecticide spraying equipment ; compiling an international pharmacopoeia ; drawing up international sanitary regulations ; revising the international lists of diseases and causes of death ; assembling and disseminating epidemiological information ; recommending non-proprietary names for drugs ; and promoting the exchange of scientific knowledge. In many parts of the world, there is need for improvement in maternal and child health, nutrition nursing, mental health, environmental sanitation, public health administration, professional education and training, and health education of the public. Thus a very large share of the Organization's resources is devoted to giving assistance and advice in these fields to countries and territories whose health services are in an early state of development and which are therefore weak points in the common front against disease.

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  The Chronicle is published in English, French, Spanish, Russian and Chinese.

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PROTEIN MALNUTRITION IN SOUTH INDIA

In 1955, the World Health Organization placed a grant at the disposal of the Indian Council of Medical Research for the extension of investigations on protein malnutrition then in progress at the Nutrition Research Laboratories, Coonoor, South India.[1] *The project was carried out during the years 1955-1957 and some of the results have just been published in the* Bulletin of the World Health Organization.[2] *These are summarized in the article below.*

The extended programme of investigation on protein malnutrition in South India included a survey of the extent and severity of this condition and of the factors contributing to its incidence, the use of vegetable protein foods in its treatment or prevention, and the evaluation of the nutritive value of proteins of the common cereals and pulses. The clinical and biochemical investigations on the two last-mentioned aspects of the programme—the results of which will be published separately—showed that vegetable proteins are capable of promoting and maintaining satisfactory growth in young animals and of efficiently regenerating blood proteins in depleted animals and that they are useful in the treatment of kwashiorkor.

The area covered by the survey was limited to South India (states of Kerala, Madras, Mysore and Andhra Pradesh). This region covers 662 650 km², with a population of 94.8 million, i.e., with an average population density of 146 per km². Over 80% of the population lives in villages, with agriculture as the main occupation. Both in urban areas and in the countryside income is often inadequate to meet nutritional requirements. Rice and millet constitute the principal crops of the region, vegetables form an important part of the diet, and groundnuts are used for the manufacture of edible oil. The four states taken together do not produce sufficient foodstuffs for their needs. Statistics for child mortality and morbidity are very inadequate, but it is estimated that in South India the proportion of deaths among children under 5 years of age amounts to 20% as compared with 3% in better-developed countries. Diarrhoeas and dysenteries, which usually precede malnutrition syndromes, rank second to fevers among the causes of death.

LOCALITIES OF SOUTH INDIA WHERE THE INVESTIGATION WAS CONDUCTED

The survey areas were selected in consultation with the directors of the health departments in the respective states, and local health officials helped the survey team

[1] These laboratories were recently transferred to Hyderabad, in the state of Andhra Pradesh.

[2] Rao, K. S. et al. (1959) *Bull. Wld Hlth Org.*, 20, 603

to make contacts with the people. The departments of agriculture, fisheries and animal husbandry furnished information on regional resources. Whenever necessary, home visits were made to study actual living conditions. In the clinical examinations conducted during the survey, signs and symptoms of malnutrition were recorded. As most cases of kwashiorkor are removed to hospitals it was necessary to examine hospital records. The matters studied included the socio-economic and living conditions of the families surveyed, their general food habits, infant care and feeding and weaning practices, the food intake among infants and young children, deficiency signs, and children's heights and weights. In addition, haemoglobin and serum proteins were determined.

The survey, which was confined to children under 5 years of age in the less favoured social groups, covered a total of 4536 children in ten widely separated rural and urban areas. In 86% of the families surveyed, the income was less than Rs 100 per month. In rural areas about 80% of the people lived in single-roomed thatched huts. The others occupied brick-built, tiled buildings. In the majority of families, the young and old of both sexes lived and slept together in the same room, a corner of which was set apart for cooking purposes. Urban conditions were somewhat better, though also very inadequate. Environmental conditions were very favourable to the initiation and spread of gastro-intestinal and other infections.

In general, the daily diet consisted of two or three meals made up mainly of cooked cereals. To this there were added small quantities of vegetables and pulses. Meat, eggs, fish or milk were consumed only occasionally and in very small quantities, and a little vegetable oil was used for seasoning. The special food needs of the vulnerable groups such as pregnant women or nursing mothers did not receive any special attention. After weaning, the children went straight on to adult foods.

Women from the poorer communities usually worked until late pregnancy and returned to work within two or three months of delivery. When the mother was at work, the baby remained at home in the care of the grandmother or an older sister. Sometimes the mother returned to the home two or three times a day to suckle the baby, whose feeding was usually carried out with absolute disregard of the principles of hygiene. Sick children did not receive any special medical attention. The only prophylactic inoculation was smallpox vaccination. Frequently, children were subjected to traditional prophylactic practices which were harmful to their health, such as the regular administration of purgatives "to clear the bowel of toxic substances", a practice which produces a state of chronic intestinal irritation in infants.

Infants were normally breast-fed. Breast-feeding began two to three days after delivery and continued into the second or third year of life; no regular feeding schedule was followed. In spite of their desire to continue suckling, very many mothers had to wean their babies during the first or second year owing to a new pregnancy or to drying of the breast. In all the areas, except Hyderabad, 74-97% of the babies were given some supplementary food during the first year. In Hyderabad, only 5% of the infants were fed supplements in this period. Supplementary food consisted mainly of cereal products or animal milk, according to tradition, price and availability. Supplementary milk was insufficient in quantity and was soon discontinued, because of its cost, in favour of cereals.

A quantitative assessment of the food intake of the children was carried out. During the first six months of lactation a steady rise was observed in the output of breast milk by mothers. This was followed, however, by a gradual fall in the milk output regardless of the child's needs. These results indicate the urgent need for supplementary feeding from the age of 6 months onwards. The study of the total calorie intake of children leads to the following conclusions:

1. On the assumption that breast milk would provide, between the ages of 7 and 12 months, an average of 7 g of protein per day, the supplementary foods were not

sufficient to make up the protein deficit in this age-period.

2. As the breast milk output declined, the quantity of supplementary foods increased, but even then the protein intake of children up to 3 years of age was insufficient.

3. It was only from 3 years of age upwards that the calorie intake approached the recommended level. Consequently, protein, and probably calorie, deficiency must exist in these children, particularly from the seventh month of life up to 3 years of age, a period which, as is well known, is characterized by the maximum incidence of kwashiorkor.

Clinical examination

The 4536 children were submitted to a careful clinical examination with special reference to signs and symptoms of kwashiorkor ; 25% of the children examined had a history of diarrhoea and 2-5% had suffered earlier from one or more episodes of oedema. Some 10-12% of the children's siblings had died of diarrhoea or oedema, or both. At the time of examination, 12-18% of the children were suffering from diarrhoea. The signs of protein malnutrition looked for in the children were dermatosis, hair changes, hepatomegaly and moon face. Oedema associated with diarrhoea and one or more of the above signs was included under the term kwashiorkor.

Diarrhoea and dysenteries were the commonest complaints among the groups surveyed. Signs of dyschromotrichia, hepatomegaly and moon face were found with varying degrees of frequency. This frequency was uniformly high in the Hyderabad area where infants had relatively less adequate diets than in other regions. Frank cases of kwashiorkor were seen in all areas. However, the number met with in the field was not high in areas where there were facilities for hospitalization.

The heights and weights of the children examined showed considerable retardation by comparison with the average figures for the United States. The degree of retardation was relatively low in the early periods of infancy but became more and more apparent as the child was switched over to mixed feeding. In addition to protein and calorie deficiencies in the children's diets, it is very probable that there were simultaneous mineral and vitamin deficiencies, as shown by the frequent occurrence of angular stomatitis and Bitot's spots. The retardation of growth must therefore be considered as the over-all effect of various deficiencies, any one of which by itself is capable of affecting growth.

In approximately 20% of the children examined, haemoglobin, total serum proteins, albumin and globulin were determined. The haemoglobin values were uniformly low in all areas. In view of the absence of malaria and the low incidence of hookworm, the mild degree of anaemia would appear to be due to malnutrition. In the absence of comparative data on serum protein and its fractions in a large number of healthy children from the well-to-do communities, it is difficult to interpret the results obtained in the survey. The levels of the total serum proteins would, however, seem to fall within the normal range. The albumin values were somewhat lower than normal, which was probably a reflection of the chronic protein deprivation to which the children were subjected.

Field surveys cannot determine the true prevalence of the clinical syndromes that require hospitalization. The investigation had therefore to be extended to hospitals. It was found that kwashiorkor accounted for 5-16% of all admissions of children, which indicates that this disease is one of the major paediatric problems in the states of South India.

Protein malnutrition syndrome and contributory factors

It is difficult to estimate exactly the prevalence of the protein malnutrition syndrome in the population under survey. On the basis of the census of 1951, the total number of children under the age of 5 years in South India may be estimated at 14.2 million. As 86% of families in the area have incomes of less than Rs 100 per month, the number of children belonging to the low-income groups must be about 12 million, assuming that the

birth-rates among different economic groups are equal. Even taking the incidence at its lowest as 1% it may be concluded that the probable number of frank cases of kwashiorkor in the region must exceed 120 000 at any given time.

Poverty is undoubtedly the main cause for the situation just described. As has been said, 86% of the families have an income below Rs 100 per month; this sum, even if spent entirely on food, would be inadequate to meet the nutritional requirements of a family.

Customs and traditional practices are the causes of the faulty feeding habits prevalent in the communities surveyed. Inappropriate choice of supplementary foods, avoidance of protein-rich foods, especially when the child is ill, and continued administration of purgatives are only a few examples of such practices. Poverty and ignorance are also responsible for the unhygienic living conditions, the inadequate child care and the indifference to the needs of the child.

Infections usually precipitated the frank cases of kwashiorkor. Nearly 25% of the children examined gave a history of frequent attacks of diarrhoea, while 12-18% were suffering from diarrhoea at the time of examination. Frequently, a mere attack of fever without any diarrhoea produced changes in the pigmentation of the hair or even oedema. Probably the nutritional status of the children was so marginal that even quite minor infections sometimes resulted in acute clinical deficiency.

It is interesting to compare the results of the present survey with those of the surveys carried out by Brock & Autret [3] in Africa and by Autret & Behar [4] in Central America, bearing in mind that the conclusions of the present survey are based mainly on detailed observations in the field, whereas those of the surveys in Africa and Central America were based on data supplied by the local authorities supplemented with limited field observations. In the three areas, protein deficiency affected mainly the poorer sections of the society. There were certain similarities in diet and in infant feeding and weaning practices. Family diets were made up of carbohydrate-rich foods, and protein foods of animal or vegetable origin rarely entered into them. Except among the white population of Costa Rica, prolonged breast-feeding of infants was a common practice in all three areas. There was a striking similarity also in the choice of the foods used in infant feeding. The food intake of children was marked by deficiency in proteins. Of the children manifesting the syndrome of protein malnutrition 40% were over 4 years of age in Central America, whereas in South India and Africa the majority were below this age.

Vitamin deficiency signs occurred with variable frequency in the different countries. In the African survey a manifest evidence of vitamin A or thiamine deficiency was not seen in association with the basic syndrome, whereas in Indonesia 70% of cases of kwashiorkor exhibited xerophthalmia. In South India some 7% of the children examined had signs attributable to avitaminosis A or to the deficiency of B-complex vitamins, or both. In Central America the disease seemed to be associated with vitamin C deficiency.

[3] Brock, J. F. & Autret, M. (1952) *Kwashiorkor in Africa*, Geneva (*World Health Organization: Monograph Series*, No. 8)

[4] Autret, M. & Behar, M. (1954) *Sindrome policarencial infantil (kwashiorkor) and its prevention in Central America*, Rome (*FAO Nutritional Studies*, No. 13)

WHO and malaria eradication

"... the present WHO programme is by far the most logical, the most economical and the most effective of all malaria programmes proposed so far. In fact, it may be said that the disappearance of this disease from every part of the world depends, above all, on the support given to this programme by the governments concerned, both in the interests of their own peoples and in a spirit of solidarity with other countries, whether near or far distant."

Henry G.-S. MORIN in *La Presse Médicale*, 1959, 67, 864

ANICTERIC VIRUS HEPATITIS

According to the first report of the WHO Expert Committee on Hepatitis,[1] the compulsory notification of cases of hepatitis is an essential measure in the control of this disease and should be introduced in all countries as soon as circumstances permit. This would make it possible to ascertain the epidemiological distribution of various forms of hepatitis and, for example, to avoid using blood donors coming from the regions where they are epidemic. But, the report adds, "Incomplete reporting of cases of hepatitis is inevitable since non-icteric cases are common in many countries, especially among children, and, being difficult to diagnose, would not generally be reported." The proportion of such cases, which are a potential source of infection, as compared with icteric cases, was not known as there was no way to detect them with certainty. A biochemical test for detection is proposed in an article, summarized below, which has recently been published in the Bulletin of WHO.[2] It must be emphasized that this test is still under investigation.

The existence of cases of virus hepatitis not accompanied by jaundice has been known for many years. Until quite recently, liver biopsy, which is not always practicable or advisable, was the only means of diagnosing such cases with any certainty, apart from cases of anicteric fulminant liver atrophy verified by autopsy. Accordingly, it was a usual practice to give only a probable diagnosis when, in an environment where cases of epidemic hepatitis had been recorded, a patient—generally a child—offered a non-specific clinical picture of an infectious disease accompanied by gastro-enteric disturbances and the biochemical examinations gave results that were normal or but little modified, i.e., light transient hyperbilirubinaemia, sometimes with partial positivity of the colloidal serum lability tests.

Notwithstanding difficulties of diagnosis, this form of hepatitis, which is now considered as from two to three times more frequent than the icteric form, particularly among children, has attracted increasing attention. It is, indeed, of great epidemiological importance, since unrecognized cases—and these are, in fact, the most numerous—are a constant source of infection both in closed environments and, for instance, among blood donors.

In 1955, De Ritis, Coltorti & Giusti [3] published a new test which makes it possible to diagnose cases of virus hepatitis and to distinguish them from other liver diseases whether icteric or anicteric. This test involves determination of the serum transaminase activity.

These and later authors showed that in cases of anicteric virus hepatitis there is an increase of serum aspartic-ketoglutaric transaminase and alanine-ketoglutaric transaminase activity, in the proportion of 2000-4000%, with, at the same time, inversion of the ratio between the first and second of these transaminases. Normally 1.33, this ratio falls below 1.00 and may fall to as low as 0.50-0.70. This modification is not absolutely specific for virus hepatitis but it is of great practical diagnostic significance. The movement of these enzymes into the bloodstream is due to hepatic necrosis which is so intense and so widespread in this disease as to bring about a level of serum enzyme activity which is reached in no other liver disease. Of great importance also is the inversion of the ratio to an extent that is not

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1953, **62**.

[2] De Ritis, F. et al. (1959) *Bull. Wld Hlth Org.*, **20**, 589.

[3] De Ritis, F., Coltorti, M. & Giusti, G. (1955) *Boll. Soc. ital. Biol. Sper.*, **31**, 394; *Minerva med. (Torino)*, **46**, 1207.

observed in any other disease, which is probably due to a metabolic abnormality of the liver tissue consequent upon virus multiplication. The test gives positive results in both icteric and anicteric forms and makes it possible to diagnose the former before the appearance of jaundice whenever necrosis of the liver is already present.

In their recent paper, De Ritis and his co-workers report the results of a systematic investigation they conducted in Rome among 104 children and 11 adults in an institution where several cases of icteric hepatitis had been observed over the preceding two years. They carried out determinations of the serum aspartic-ketoglutaric and alanine-ketoglutaric transaminase activities approximately every 15 days. This work was continued over a period of 60 days and some 1000 enzyme determinations were made. Throughout the period of observation, the findings were normal in 69 of the children. In 4, the findings were considered doubtful, whilst in 31 of the children and one of the adults they were positive. Only one of the children and the single adult affected developed jaundice at any time during the course of the disease. Many of the children showed clinical symptoms of hepatitis such as anorexia, dyspepsia, hepatomegaly and concurrent or delayed positive serum lability tests.

These results led the authors to the following conclusions :

1. In the first place, there may frequently be dissociation between jaundice—which may be considered merely as an additional and late symptom—and hepatic necrosis, an essential physiopathological phenomenon in this disease and the direct consequence of the multiplication of the virus in the liver tissue.

2. The occurrence of jaundice in one of the cases, nine days after the demonstration of serum enzyme findings—the equivalent in the blood stream of necrotic damage to the liver tissue—leads to the conclusion that the incubation period of virus hepatitis is longer than was previously thought.

3. The anicteric forms of hepatitis predominate over the icteric forms much more in children than in adults. In the former the ratio is 30:1, whereas in the latter, according to various authors, it is usually 3:1. It was also found that children are much more susceptible to the disease than adults.

4. From the epidemiological standpoint, these studies and other similar investigations are of great importance. Cases of anicteric virus hepatitis are generally not recognized or their existence is recognized only at a late stage of development, when they have had time to be the source of secondary infections. They play an even greater part as sources of infection when they occur in more or less closed communities or among blood donors. There is naturally no difference between the epidemiology of the icteric forms and that of the anicteric forms.

5. Finally, anicteric virus hepatitis may give rise to cirrhosis of the liver which may not be recognized. Statistically, hepatitis is a much more important cause of cirrhosis than other conditions which are classically associated with it, in particular, alcoholism and malnutrition. In some cases, hepatitis may develop directly into cirrhosis during the acute phase of the disease. The period of clinical latency which sometimes is observed between hepatitis and cirrhosis would seem to represent the time necessary for the modifications resulting from the infection to produce the chronic lesions that are specific of cirrhosis. The authors have not attempted to postulate a constant and direct relationship between virus hepatitis and cirrhosis, but they believe that their observations are sufficiently characteristic to be of interest to other research workers.

These results are still under investigation.

THE TREATMENT OF GONORRHOEA

The annual report for 1957 of the Ministry of Health for England and Wales [1] showed a further steep rise in the number of new cases of gonorrhoea of both sexes attending venereal disease clinics. If the considerable number of cases treated by doctors privately is also taken into account, the number is beginning to approach that of the war years. This is in marked contrast with syphilis. In many countries the number of cases of early syphilis treated annually has fallen to as little as 5% or less of the war and post-war peaks. This contrast prompts two questions : first, given the known efficacy of penicillin in both diseases, is there any explanation for this divergence in the results of treatment of these two closely linked diseases; and second, is the divergence likely to continue ? Dr R. R. Willcox, WHO Consultant on Venereal Diseases and Treponematoses, discusses these two questions in a recent number of the WHO Bulletin.[2]

Penicillin was introduced as a treatment for gonorrhoea during the Second World War. By then the sulfonamides, which had revolutionized treatment a few years before, had become ineffective in many parts of the world ; so much so that, according to one report,[3] they failed to produce a cure in 75% of cases in Italy in 1943. This growing ineffectiveness was due to what is known as the increasing "resistance" of the gonococcus to the sulfonamides, meaning its decreased susceptibility to them. From the time of their introduction approximately 10% of cases of gonorrhoea had failed to respond to these drugs, and susceptible strains were gradually weeded out by this process of drug selection, leaving the resistant strains. Acquired resistance was also, it is thought, fostered by the indiscriminate use of sulfonamides, in inadequate amounts and at irregular intervals, for the most trivial complaints.

The gonococcus, on the other hand, appeared not to be naturally resistant to penicillin: cases of gonorrhoea responded, provided that the penicillin was maintained at an effective serum level for a sufficient period of time. Success in treatment was reported, from all over the world, in 90-100% of cases, whether the penicillin was given in the form of injections of aqueous penicillin, penicillin-in-oil beeswax, procaine penicillin G, repository penicillins, combinations of penicillin, or oral penicillin. At the beginning, because of the fear that the penicillin given for gonorrhoea might mask, but not cure, syphilis acquired at the same time, it was given in low dosage, but as it became clear that even small doses of penicillin given for gonorrhoea would completely abort incubating syphilis the dosage generally given tended to rise. A WHO survey in 1955 [4] of the management of venereal diseases in ports revealed that 27% of those participating used an injection of 1.2 mega units or more of repository penicillin—usually in the form of procaine penicillin in oil with 2% aluminium monostearate (PAM)—while 84.4% used an injection of 0.6 mega units or more.

Notwithstanding the rising dosage of penicillin, the failure rate in the treatment of gonorrhoea with repository penicillin has been increasing: there has been a persistence or relapse of the infection on all too many occasions after treatment. It is not possible on clinical grounds to distinguish between a relapse and a re-infection. If gonococci are still present after 24-48 hours, it may reasonably be assumed that treatment has failed; if there is a recurrence after three months it may equally reasonably be assumed that the case is one of re-infection, even if the patient denies it. But in between these two clear-cut instances lies uncertainty. Nevertheless, the general consensus of opinion

[1] Ministry of Health for England and Wales (1958) *Report of the Ministry of Health for the year 1957. Part II. On the state of the public health*, H.M. Stationery Office, London

[2] *Bull. Wld Hlth Org.*, 1958, **19**, 503

[3] Campbell, D. J. (1944) *Brit. med. J.*, **2**, 44

[4] *Bull. Wld Hlth Org.*, 1957, **16**, 10-33

is that repository penicillins are no longer as effective as they were in the treatment of gonorrhoea. Part, but by no means all, of the answer to the first question propounded at the beginning of this article is thus that, in comparison with the treponeme of syphilis, the gonococcus is apparently not as sensitive to penicillin as it once was. In addition, it should be remembered that many more people are susceptible to gonorrhoea than to syphilis (a proportion of urban adults are seroreactors, and so are relatively immune); gonorrhoea is three to four times more common than syphilis, and has a short incubation period (usually 2-7 days), so that infection and spread are likely to be greater and certainly are quicker; and gonorrhoea is the more infectious disease of the two and is therefore more likely to be acquired following a single exposure. It may remain infectious for a long time if it is undiagnosed, untreated, or inadequately treated, particularly in women, in whom there may be no alarming signs or symptoms; indeed, existing methods of diagnosing gonorrhoea in the female leave much to be desired. Nor is any substantial immunity produced by an acute attack. Syphilis, on the other hand, being less infectious, may be acquired by only 50% of those exposed to it. As its incubation period is a long one (2-5 weeks), diagnosis of an infection gives the authorities a relatively long period in which to track down and treat contacts before they too become infectious; and the length of the incubation period increases the chances of penicillin being given for an unrelated condition.[5]

Is the gonococcus likely soon to become as resistant to penicillin as it became to the sulfonamides ? No definitive answer can be given to this question, since no one can predict the future behaviour of these bacteria; but Dr Willcox advances several reasons for making a guarded reply in the negative. One reason is that the resistance of the gonococcus to penicillin consists at present only of a reduced sensitivity, and is thus a developing phenomenon; that of the gonococcus to the sulfonamides was in some cases complete from the outset. Moreover, the problem of resistance is limited at present to the repository penicillins, which produce low, though prolonged, serum levels. There is still no definite resistance to penicillin preparations which produce high serum levels for a sufficient time. It has taken nearly fifteen years of constant treatment with penicillin to reach this situation, and it may reasonably be assumed that it will take a considerable time for penicillin to decline to the state of ineffectiveness so rapidly reached by the sulfonamides. Another reason is that there were no effective alternatives when the sulfonamides were first used, so that resistant strains soon became widespread. Now there are many alternatives to penicillin: streptomycin, tetracycline, oxytetracycline, chlortetracycline, spiramycin, erythromycin, oleandomycin, chloramphenicol, or certain combinations of these, all of which give reasonably good results in the treatment of gonorrhoea. Resistant cases can thus be treated adequately by other means before the organism becomes widely disseminated. As in the case of the developing resistance of the staphylococcus to penicillin, too, if the use of penicillin is discontinued for a time the organisms may again become sensitive. A rapid appearance of complete clinical resistance of the gonococcus to penicillin is thus unlikely.

In the same issue of the Bulletin,[6] however, Dr T. Guthe, Chief Medical Officer, Venereal Diseases and Treponematoses, WHO, Geneva, points out that experience in human pathogens and in insects suggests that, once resistance has begun, it progresses, not at a uniform rate, but often at an accelerating rate. The short-acting penicillins with high serum levels now being used, while perhaps of temporary benefit, may only further weaken an already weakening epidemiological barrier because a patient is protected for a shorter time than with repository penicillins and so may become re-infected more quickly. This change of preparation may also affect the incidence of syphilis, since short-acting penicillins, disappearing quickly from the blood, are less likely to abort it in the incubation period. Both authors are agreed that

[5] *Bull. Wld Hlth Org.*, 1958, **19**, 405.

[6] *Bull. Wld Hlth Org.*, 1958, **19**, 405.

the public health prognosis of gonorrhoea is less favourable than it was even a few years ago, in spite of the other drugs available.

There is a general impression that, whether as a result of modern treatment or not, gonorrhoea has become a milder disease: severe complications, such as rheumatism, arthritis, iritis, and—though to a lesser extent—epididymitis and prostatitis, are now relatively seldom encountered. It has indeed been suggested that the disease may now sometimes be so mild that some infected males, as well as females, are virtually asymptomatic, a situation which carries its own special dangers.

Whatever the future has in store, however, the present situation requires close watch. The indiscriminate use of penicillin should, in view of previous experience with the sulfonamides, be discouraged as far as possible, and every effort made to ensure that the doses of penicillin (or other antibiotic) used in the treatment of gonorrhoea are adequate. The alternatives the physician is faced with are larger doses of repository penicillins, shorter-acting penicillins, or mixtures of both; or antibiotics other than penicillin, alone or in combination. Which he should use, in the light of the apparent lessened susceptibility of the gonococcus to penicillin, is one of the pressing problems of the treatment of venereal disease. It will be among those considered by a WHO Expert Committee on Venereal Infections and Treponematoses which will meet in Geneva in September 1959.

ACCIDENTS IN CHILDHOOD IN THE AMERICAS

" The prevention of accidents in childhood " was the subject of the technical discussions at the XVth Pan American Sanitary Conference, which was held at San Juan, Puerto Rico, from 21 September to 3 October 1958, and served as the tenth session of the WHO Regional Committee for the Americas.[1] *The article that follows is based on a paper by Dr James L. Goddard, Chief, Accident Prevention Programme, United States Department of Health, Education and Welfare, which was used as a basis for the discussions and subsequently published in the* Boletín de la Oficina Sanitaria Panamericana.[2]

In 13 countries of the Americas accidents are already the chief cause of death in the age-group 5-14, and if the trend of the last two decades continues, they will, within the next twenty years, be the chief cause of death for all ages from 1 to 15 in a great many American countries. They cause immense losses in human resources, non-fatal accidents being in this respect more dangerous than non-fatal diseases; for, with rare exceptions like poliomyelitis, the latter end in complete recovery, whereas non-fatal accidents may lead to prolonged invalidism, often permanent (if eyesight or a limb is lost), and so constitute a constant drain on the individual, the family, the community, and the nation. Treatment of accident cases in hospital is also usually more costly than treatment of an infection, because it takes longer and is more specialized.

Mortality rates in the Americas are much lower in the age-group 5-14 than in the age-group 1-4. In the latter, accidents are the principal cause of death in the United States and in Canada, but appear among the five main causes of death in only 8 out of 18 other countries; on the other hand, diarrhoeal diseases are the principal cause of death in 12 countries and appear as one of the five main causes in all countries, but rank only as fifth in the United States and Canada. In the age-group 5-14 accidents are the principal

[1] See *Chronicle*, 1958, **12**, 410-411.
[2] *Bol. Ofic. Sanit. Panamer.*, 1959, **46**, 11.

cause of death in two-thirds of all American countries, and are among the five main causes in all countries but Guatemala. There are few statistics of morbidity from accidents, but there is some evidence to the effect that it ranks in importance with morbidity from the commonest non-fatal diseases; in California, for example, an inquiry made in 1954-1955 placed incidence of illness from accidents second to illness from respiratory infections in children under the age of 15. In November 1956, according to an American Medical Association Hospital Survey, 8% of all hospital beds in the United States were occupied by victims of accidents. In 1957, 10% of admissions to the La Posta Children's Hospital, Valparaiso, Chile, were due to accidents.

Among the most frequent causes of accidental deaths are traffic accidents, drowning, burns, poisons, and bites and stings of poisonous insects and reptiles. Boys are victims more often than girls, presumably because they are more active and take greater risks. There are also differences between the sexes in the type of accident: in Venezuela, for example, burns are the most frequent cause of accidental death among girls in the age-group 5-14, whereas drowning is the most frequent cause among boys. The reason for this is that the girls stay at home more, do some cooking, and, of special importance, wear clothing which is more likely to catch fire. There are also differences depending on the age-groups. Accidental poisoning is commonest in children under 2 because of the well-known propensity of small children to punt things in their mouths. In the United States the principal causes of accidental poisoning are petroleum products, aspirin and other salicylates, and arsenic and lead compounds. In some Central and South American countries, however, the common poisons are petroleum products, insecticides, and pesticides; salicylates and the like rarely come into the reckoning because they are not consumed in any great quantity in these countries.

It is estimated that, in the United States, 16 000 000 children, two-thirds of them boys, are victims of accidents every year; 45% of all accidents to children occur in the home, 10% on the roads, 30% in public places, and 14% at work. This estimate does not differ greatly from one based on a study of accident cases treated in the emergency room of a municipal hospital in San Juan, Puerto Rico, where the figures placed 56% of accidents in the home, 6% on the roads, 34.5% in public places, and 3.5% at work.

Because there are so many causative factors, no single solution to the problem of accidents in children can be advanced. For prevention, a better assessment of the problem, based on the study of morbidity and mortality data, is needed. Accident studies have already led to the adoption of specific preventive measures: thus, in the United States, after investigation, manufacturers redesigned refrigerators to prevent children from asphyxiating themselves if they climbed in and closed the door; and various protective devices were introduced into motor cars after a study by Cornell University of the types of injury caused by motor car accidents. Protective devices could help to reduce the incidence of accidents from burns in Chile, where a brazier is traditionally used for cooking in rural areas, either on the floor or just outside the door.

Education is the key to accident prevention. The public health authorities, physicians, paediatricians, schoolteachers, parents, and all local groups and organizations should realize this and play their part. The work of the public health department in this field should be co-ordinated with that of the other agencies, including education and traffic departments. Legislation may be required: in the United States, for example, laws have been passed to control the use of inflammable materials for children's clothing and the manufacture and sale of insecticides.

If accidents do occur much can be done to minimize their consequences. Accident cases should be treated quickly and effectively, and emergency services improved. Finally, rehabilitation services should also be improved so as to reduce the degree of disability following severe injury.

STATISTICS AND CANCER

It has become a platitude to remark that, at least in the more highly developed countries of the world, cancer is increasing *pari passu* with the increasing age of the population. Cancer research is likewise increasing, and is now being conducted on an impressive scale, particularly in the United States of America and in parts of Europe. Until now, WHO has accordingly concentrated most on the co-ordination of statistical studies, so as to give a world picture of the disease, and has also paid much attention to the institution of cancer registers in countries where the medical and statistical services are sufficiently developed to make them a practical possibility. As early as 1950 a WHO Sub-Committee on the Registration of Cases of Cancer suggested definitions, rules, and procedures for the compilation of statistics on the results of treatment, and for computing survival and recovery rates.

A WHO Sub-Committee on Cancer Statistics which met in 1957[1] discussed methods of obtaining statistics of the incidence and prevalence of cancer, which are an essential part of the organization of medical care, cancer control, and epidemiological research. Mortality statistics are not a reliable measure of the incidence or prevalence of the disease because of the different survival rates of the various kinds of cancer. Compulsory notification, as for communicable diseases, suffers from the disadvantage that the minimum amount of useful information required for cancer is considerably more than is normally obtained for communicable diseases; but it provides information which because of its confidential nature may not otherwise be obtainable. National cancer registration would be effective in small countries, but it is doubtful if the results would justify the work involved in large countries. Surveys, on the other hand, either *ad hoc*, of the type carried out in the United States of America and France, or as a by-product of general morbidity surveys, do offer a distinct possibility. Other sources are generally inadequate, and the Sub-Committee felt that on the whole investigations not specifically adapted to cancer do not supply the information required.

In a paper recently published in the WHO Bulletin,[2] Dr Percy Stocks, formerly Chief Statistician (Medical) of the General Register Office, London, writes on cancer registration and studies of incidence by surveys. Registration of cancers of certain types has been practised in some countries for many years: for example, epitheliomas due to tar, pitch, bitumen, mineral oil, paraffin, and soot have been notifiable in England and Wales since 1895. In 1908 the first attempts were made in Norway and Denmark to register all new cases of cancer. In Norway, after a prolonged trial, it was realized that the medical and statistical resources available were inadequate for the purpose. In Denmark a census method was tried, but although the response was good the method was found less useful than the continuous registration of cases. In 1927 cancer registration was initiated in Massachusetts, and registration has gradually been instituted in a number of other countries and states. New York State made cancer reporting compulsory in 1940. In 1952 Norway introduced cancer registration based on compulsory notification.

The amount of information asked for in cancer registration or in surveys varies, but may be grouped in the following way:

Personal information about the patient

A. Name
B. Address
C. Places of previous residence (with durations)
D. Sex
E. Dates of birth and registration (or death) and/or age at registration
F. Place of birth

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1959, **164**, 27

[2] Stocks, P. (1959) *Bull. Wld Hlth Org.*, **20**, 697

G. Marital state
H. Occupation
I. Previous occupations (with durations)
J. Nationality
K. Parentage (race) (colour)
L. Whether a twin
M. Work-place, travel to work
N. Kind of house, heating and lighting
O. Sources of water and food
P. Dietary habits (present and past)
Q. Smoking habits
R. Age at marriage (females)
S. Number of confinements (females)
T. Age at menopause (females)
U. Informant
V. Name of family doctor

History of illness

a. Date of first symptoms
b. Nature of first symptoms
c. Date of seeking medical advice (or interval after " a " above)
d. Date of first hospitalization
e. Date of starting treatment
f. Date of death

Information about neoplasm

1. Diagnosis at admission to hospital
2. Final diagnosis (at discharge or death)
3. Site of primary growth (or of main secondary if unknown)
4. Nature of primary, histology
5. State of primary
6. Site of metastases
7. Method of diagnosis
8. Kind of treatment
9. Reason for not being treated

Not all of this information is asked for by all countries and states which have cancer registers and surveys, but most of it is, and compared with, say, the international certificate of cause of death the amount of work involved in its collection is formidable and not lightly undertaken. Without it, on the other hand, statistics of cancer are of little value.

In the early years of a registration system the proportion of cancers remaining unreported until death is large. In Tyneside it was 31.1% in 1953, but it fell to 22.4% in 1954, the second year; in Connecticut it was still 17% after some 15 years of registration. Obviously incidence rates based on the age at first diagnosis and the age at death differ considerably from the more realistic rates based upon the age at the first onset of symptoms. After a registration scheme has been in existence for some years the crude morbidity rates at all ages for stable forms of cancer, i.e., cancer which is neither increasing nor decreasing in incidence, will tend to be approximately the same, whatever the criterion chosen for the starting-point of the disease; but the morbidity rates per age-group will not, because of the difference between the time of onset and the time of diagnosis and registration. There will also always be a number of patients who will not be registered until death (if then), because the diagnosis is uncertain. Apart from these difficulties, which arise from the nature and course of the disease, the quantity of information asked for, the complication of the form to be filled in, and the possibly lengthy follow-up require a considerable amount of application on the part of the medical practitioners who do the registering, and it cannot be expected that the results will be other than sketchy in the early years.

When a cancer register has reached the stage of producing a reliable series of rates of incidence by sex and by age, it will become possible to study the incidence of cancer of different sites in relation to racial, marital, and social characteristics and habits. If its age distribution is known, a subgroup of the population can be investigated, by comparing the numbers known from the register to have developed cancer at a particular site with the numbers that would be expected if the subgroup was as liable to that form of cancer as the population is as a whole. An unusual incidence of a particular form may shed light on the etiology and pathogenesis of cancer, on regional or racial differences, or on environmental factors ; or it may point the way to new methods of control or care.

INTERNATIONAL WORK IN HEALTH STATISTICS, 1948-1958

3. Securing international comparability [1]

Efforts to secure international comparability in health statistics began as early as 1851 on the initiative of certain intergovernmental and voluntary organizations. Attention was then focused primarily on developing a uniform nomenclature and classification of diseases and causes of death. This in turn brought out the need for establishing uniform rules for the selection and certification of the cause to which a particular death was to be ascribed in case there were several contributory causes, occurring jointly or successively. It was soon found that a number of complex technical and administrative procedures, ranging from the certification of the cause of death to the final tabulation of the mass of data on mortality by age, sex, locality, cause, etc., required standardization. Many of the problems involved have been successfully resolved, thus greatly contributing to the value and international comparability of health statistics, and particularly mortality statistics.

During the last half-century, the widening in scope of public health activity from control of preventable diseases and improvement of environmental sanitation to the promotion of health has created an increasing demand for comparable data on factors and conditions affecting the public health, e.g., on such subjects as maternal and child health, school health services, mental health, etc. Scientific advances in medicine and statistical methodology have further emphasized the importance of detailed and comparable statistical information. While many old problems still remain unsolved, new ones are appearing—for example, in connexion with the recently developed practice of measuring and comparing general morbidity levels of populations by sample surveys, many of which are planned on a national scale.

[1] For the first two parts of this account of WHO's work in international health statistics, see *Chronicle*, 1959, 13, 67, 214.

The role of WHO

While the responsibility for operating national health statistical services rests with the country concerned, it has fallen to WHO to take steps to develop uniform terminology, definitions, recording procedures, classification schemes and, at the same time, to devise uniform programmes for the tabulation and interpretation of data by means of uniformly computed health statistics indices. Each of these tasks requires, in the first instance, a world-wide study of the nature and causes of variations in statistical procedure. Some of these variations are bound up with the special needs of the country concerned, some exist because of long-standing legal and administrative provisions, and some are related to the country's stage of development. But the keen desire of each country to compare its statistical indices on health with those of others has been fully demonstrated by the co-operation that WHO has received in its exploratory work and the willingness of the various countries to adopt international recommendations.

WHO has been particularly concerned to improve definitions of terms used in vital and health statistics and to make them comparable —tasks which are clearly inter-related. Through the Expert Committees set up by the Organization, steady advances have been and are being made towards greater uniformity in this field. These Committees deal on the one hand with specific diseases, such as tuberculosis, malaria, treponematoses, cancer and heart disease, to name only a few, and on the other with general services, such as public health administration, environmental sanitation, maternal and child health, nutrition and mental health.

The recommendations of these Committees appear in the various reports in the WHO *Technical Report Series* and cannot be described in this brief review, though mention should be made of the reports of the WHO

Expert Committee on Health Statistics, which are of particular interest to those seeking guidance on special definitions and the classification of disease.

Some special definitions

Health authorities are becoming increasingly concerned with the prevention of avoidable deaths in the period of gestation and during infancy, especially where the major preventable diseases have already been brought under control. In the absence of proper definitions, work in this field is hampered on both the national and international levels. In respect of stillbirths or foetal deaths, for example, it is obviously essential that there should be uniform agreement among those responsible for the notification of deaths in each country on the criteria for deciding whether a baby is born dead or has died after birth. This distinction is important for the recording of vital statistics which will be affected according to whether entries are made under births and deaths in general, or in a special category for foetal deaths. Moreover, it is necessary in order that public health authorities may assess the nature and extent of the problem and take appropriate measures for dealing with it.

The importance of a universally accepted definition of stillbirth was recognized by the League of Nations Health Organisation, and its Committee of Expert Statisticians adopted the following definition in 1927: " A dead-birth is the birth of a foetus, after at least twenty-eight weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." [2]

This definition does not provide uniform and definite criteria for differentiating between a stillbirth and a live birth. At the end of the Second World War, a wide variety of definitions were still in use throughout the world, and this created many difficulties in the analysis of statistics by public health offices.[3] In certain countries, e.g., Spain and some of its former South American colonies, a child had to survive 24 hours to be registered as a live birth. In others, including France, the case of a child born alive but dying before registration was counted as a stillbirth; and in yet others it was counted as a death, but not as a live birth. Such differences in classification might, in some cases, mean a reduction in the general death-rate of the order of 1.2%.

The Second World Health Assembly called for the establishment of a subcommittee to study the question of the definition of stillbirth and allied matters. It asked for:

" (*a*) special studies on live births and foetal deaths in relation to various factors (gestation period, birth weight, single or multiple birth, etc.) to obtain a statistical basis for a satisfactory definition of immaturity;

(*b*) classification of foetal deaths when more than one cause is stated;

(*c*) magnitude of loss of foetal lives at various periods of pregnancy;

(*d*) better utilization of records of maternity and children's hospitals for medical-statistical research into the causes of foetal and infant death." [4]

A WHO Subcommittee on the Definition of Stillbirth and Abortion met in 1950. After due consideration, it proposed the definitions given below, which were approved by the Expert Committee on Health Statistics and subsequently adopted by the Third World Health Assembly. The universal use of these definitions would clearly go far to provide comparable data on perinatal mortality.

The definitions are :

" *Live birth* is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the

[2] League of Nations (1927) *Report of the Committee [of] Expert Statisticians on the definition of stillbirth*, Geneva (Document C.H./Expert Stat./46)

[3] Pascua, M. (1948) Diversity of stillbirth definitions and some statistical repercussions. *Epidem. vital Statist. Rep.*, 1, 210

[4] *Wld Hlth Org. techn. Rep. Ser.*, 1950, 25, 5

umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live born."

" *Foetal death* is death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles."

" All live-born infants should be registered and counted as such, irrespective of the period of gestation, and if they die at any time following birth, they should also be registered and counted as deaths." [5]

The International Statistical Classification of Diseases, Injuries and Causes of Death

Part 1 of this account carried the history of this significant international instrument as far as the fifth revision of the International Lists of Diseases and Causes of Death, which took place in 1938.

The sixth decennial revision, for which WHO became responsible, was largely prepared before the Organization was created. Following the fifth revision, a United States Committee on Joint Causes of Death, commencing work in 1945, had prepared a Proposed Statistical Classification of Diseases, Injuries and Causes of Death. This Committee included representatives of Canada, the United Kingdom and the Health Organisation of the League of Nations. Its proposed classification was indeed the first successful effort to bring both mortality and morbidity statistics into one list and had been evolved after trials in the United States, Canada and the United Kingdom. The Expert Committee on Health Statistics, set up by the WHO Interim Commission in 1947, submitted this classification to various national health and statistical authorities and presented it to the International Conference for the Sixth Revision convened by the French Government in April 1948 in Paris. Having been endorsed by the Conference, it was finally adopted by the First World Health Assembly in July 1948. This Assembly also adopted the WHO Nomenclature Regulations.[6]

These Regulations were significant, making use for the first time of the important provision in the WHO Constitution whereby regulations adopted by the Assembly would automatically come into force in all those Member States which had not formally rejected them or entered reservations against them. In the past, the revision conferences had merely made recommendations to countries to adopt the revised lists, frequently an ineffectual procedure. The Regulations were thus the first application of the principle of " contracting out " in international health.

The Regulations cover a comprehensive programme of international co-operation in statistics, requiring Member States to publish statistics of causes of death for: (*a*) the territory as a whole; (*b*) principal towns; (*c*) national aggregates of urban areas (districts); and (*d*) national aggregates of rural areas (districts). There are additional responsibilities accepted by countries observing the Regulations such as undertakings to publish statistics of causes of death by prescribed age and sex groupings, and in accordance with the classification, nomenclature, and numbering of the International Classification of Diseases, Injuries and Causes of Death.

Perhaps the most important feature of the Nomenclature Regulations is the requirement that each Member State must adopt a form of medical certificate that provides for the statement of the disease or condition directly leading to death, together with such antecedent morbid conditions as may exist, so that the underlying cause of death will be clearly indicated, together with any other significant conditions contributing to death which are not, however, related to the disease or condition causing death.

[5] *Wld Hlth Org. techn. Rep. Ser.*, 1950, **25**, 12

[6] *Off. Rec. Wld Hlth Org.*, 1948, **13**, Annex 1. The full title of these Regulations is: WHO Regulations regarding Nomenclature (including the Compilation and Publication of Statistics) with respect to Diseases and Causes of Death.

The action of the First World Health Assembly in adopting the WHO Nomenclature Regulations and the associated lists of the sixth revision was indeed a landmark in international health statistics. Among the features which make it outstanding are: the agreement on a single list of terms applicable to both mortality and morbidity statistics; the comprehensiveness of the Classification; the degree of uniformity achieved; the agreement on a form of medical certificate based on the selection of the main cause of death to be tabulated; and the guidance given in a set of rules to national compilers using the lists.

In 1948 WHO implemented one of the decisions of the First World Health Assembly by publishing in two volumes the *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death*, which was issued in English, French and Spanish. A shortened form in Latin [7] was produced in 1955 at the request of a number of countries, mainly of central and northern Europe, which still use medical terminology in this language. This *Index Alphabeticus* does not provide for a classification of violent causes of death or illness according to the external agent involved, since there is no generally accepted nomenclature in Latin for describing external causes of death and their action (vehicles, firearms, etc.).

The sixth revision, as adopted in 1948, also includes a detailed, an intermediate, and an abridged list, thus maintaining the tradition of the earlier revisions. The detailed list contains three-digit categories in seventeen main sections, covering, *inter alia*, the chief infectious diseases, neoplasms, allergies, and metabolic and nutritional diseases. Other diseases are grouped mainly according to their principal anatomical sites, but there are special sections for mental diseases, complications of pregnancy and childbirth, early infancy, senility, and ill-defined diseases. Injuries are placed in a dual classification, firstly according to the external cause, secondly according to the nature of the injury.

The introduction of the decimal classification in the detailed list has the advantage of making changes in the numbers given to items unnecessary when alterations from previous revisions are made. The first two digits of the three-digit number in many instances designate important groups of diseases, while the third divides each group into categories which represent a specific disease or its classification according to some significant feature, such as the anatomical site. Certain numbers have been omitted to provide for future additions. The intermediate list includes 150 causes for tabulation of morbidity and mortality; the abbreviated list 50 causes for tabulation of mortality. A special list contains 50 causes for tabulation of morbidity for social security purposes.

The Manual also contains certain supplementary classifications, a model medical certificate of the cause of death, and an alphabetical index of diagnostic terms coded to the appropriate categories. A part of the Manual includes sub-divisions of many of the three-digit categories into four-digit categories. These are intended for use by countries or services which wish to make more comprehensive studies of causes of illness, disability, or death.

Although no serious objection has been made to the general structure of the Classification, an important section of the introduction to the Manual deals with certain of its features which have been questioned. Some of the shortcomings of the Classification reflect the persistent division of opinion between those using the anatomical and those favouring the etiological approach. The position given to such diseases as rheumatic fever, pneumonia and influenza has also been criticized, since opinions differ as to the emphasis to be given to the conditions themselves or their complications and sequelae. Language is the source of serious problems. As the introduction puts it: "It is evident that versions of the Classification in languages other than English cannot be mere literal translations of the original text but must be adapted to the medical terminology in actual use. Efforts have already been made by the World Health

[7] World Health Organization (1955) *Index alphabeticus Classificationis Internationalis Statisticalis Morborum, Injuriarum et Causarum Mortis*, Geneva.

Organization to compile French and Spanish versions from the basic English text, employing medical terms in actual use while at the same time preserving as much as possible the original meaning and intent. Further improvement can be brought about by the users of the Classification in communicating such differences in local usage to the World Health Organization and by the physicians themselves in stating the meaning and the prevalent usage of a medical term." [8]

Seventh decennial revision

In accordance with the decision to revise the Classification every ten years, preparations were made for the seventh revision shortly after the publication of the Manual. A series of meetings of expert groups was arranged as for the sixth revision, the results of the experience gleaned from the use of the Manual throughout the world were collated, and governments were consulted for their views on how the Classification could best be improved. WHO's health statistical services had by now been established, and provided an international clearing-house for the co-ordination of statistics, as well as promoting their international comparability. The WHO Expert Committee on Health Statistics furnished advice and assistance and special technical questions were considered by its subcommittees: as, for example, the Subcommittee on Definition of Stillbirth—which dealt with the problem of enlarging and improving the relevant categories in the Classification, which had proved in practice to be too few or insufficiently specific—and the Subcommittee on the Registration of Cases of Cancer as well as their Statistical Presentation. A Conference on Morbidity Statistics was held in 1951 to discuss the problems involved in the compilation, presentation and analysis of statistics of disease.

An important additional source of advice and experiment in the use of the Classification was the WHO Centre for Problems arising in the Application of the International Classification of Diseases, Injuries and Causes of Death. This had been set up by the Third World Health Assembly [9] in 1951 on the recommendation of the Expert Committee on Health Statistics, and had been established in the General Register Office of England and Wales; not inappropriately, for this was the office from which William Farr had issued the annual reports which did so much to set health and vital statistics on a firm foundation.

In the role of technical adviser and " laboratory " the Centre has dealt with a variety of practical problems encountered by countries in applying the Classification. It has helped in the interpretation of obscurities; advised on tabulation; listed ambiguities, defects and errors; studied the problems arising in practice from the utilization and coding of death certificates; advised on training in the use of the Classification; conducted research into national records on certification of causes of death, reporting of morbidity in hospitals and sickness surveys; and drawn up practical instructions on how to collect, record, code and classify data in accordance with the Classification.

The Centre was responsible for the compilation of booklets of instructions,[10] some of which will be considered later; and it assessed changes in comparability of statistics due to the passage of time,[11] basing itself on the constant flow of reports and queries from governments.

The mass of information accumulated from these various sources was considered by an advisory group which met in London in 1954 and proposed certain amendments to the Classification. These amendments were in turn considered by the Expert Committee on Health Statistics and later by the International Conference for the Seventh Decennial Revision, which met in 1955 in Paris.

[8] World Health Organization (1957) *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death, 1955 revision*, Geneva, vol. 1, p. xxxiii.

[9] World Health Organization (1957) *Handbook of resolutions and decisions*, 4th ed., p. 22.

[10] World Health Organization (1952) *Medical certification of cause of death*, Geneva; World Health Organization (1953) *Supplementary interpretations and instructions for coding causes of death*, Geneva.

[11] World Health Organization (1952) *Comparability of statistics of causes of death according to the fifth and sixth revisions of the International List*, Geneva.

This Conference made recommendations regarding the certification of death; suggested deferring the problem of the classification of stillbirth until more experience had been gained from the use of the existing classification; and advised less stringency in the application of certain of the WHO Nomenclature Regulations because the obligations they imposed upon countries sometimes exceeded national resources and even needs. It paid special attention to the major problem of obtaining information on health conditions in areas without doctors, where causes of death could not be based on a proper medical diagnosis so that there could be no question of applying the International Classification. There was general agreement in the Conference that information was obtainable from such areas, both on diseases and on causes of death, by means of simple lists of causes stated in terms of obvious symptoms or, broadly, in terms of anatomical sites or systems. The Conference accordingly recommended that WHO consider ways and means of obtaining information in these areas, and co-ordinate national or regional studies on the subject.

The Ninth World Health Assembly adopted the seventh revision and the additional regulations giving effect to the various recommendations.[12] As experience had shown that the WHO Nomenclature Regulations were difficult to apply in many countries, they were amended so as to allow greater freedom and flexibility in the reporting and recording of deaths and provide more convenient lists and age-groupings for particular types of disease. There was no sacrifice of the fundamental principles of statistical uniformity and comparability.

The seventh revision, and the attendant regulations, came into force on 1 January 1958. It conformed to its predecessor in most respects, incorporating such advances in the diagnosis of disease and causes of death as had been made since the sixth revision.

Basically, the Classification as evolved by the sixth and seventh revisions is a compromise, as it must be if it is to be accepted internationally. It is designed to be used by doctors educated at different medical schools in different countries with different backgrounds over a period of more than fifty years of rapid progress in medicine, and to meet the varying requirements of hospitals, vital statistics offices, medical services of the armed forces, social insurance organizations, sickness surveys, and a host of other agencies, as well as of the relatively or absolutely unqualified person who will apply it (in simplified form) in areas where there are no doctors. Attempts to provide a statistical classification based on a strictly logical arrangement of morbid conditions have hitherto failed, and the Classification has accordingly had to effect a compromise between classifications based on etiology, anatomical site, age, and circumstances of onset. As Farr observed: "The medical practitioner may found his main divisions of diseases on their treatment as medical or surgical; the pathologist, on the nature of the morbid action or product; the anatomist or the physiologist on the tissues and organs involved; the medical jurist on the suddenness or the slowness of death; and all these points will deserve attention in a statistical classification."

The Classification has not only had to pay attention to these points, but also to take the quality of the information available in medical reports into consideration. It is therefore not surprising that there has been criticism of some categories, usually based upon disagreement regarding the etiology of some disease or its place in a certain group. With improved knowledge it is to be expected that in due course each disease or group of diseases will be classified in a way that commands international support.

Medical certificates of death: application of the Classification to causes of death

Early records of death usually mentioned only one cause but in the course of time it became recognized that two or more causes were often involved and that it was important to decide carefully which was the main one. Certain principles were laid down in the first revision of the International List of

[12] *Off. Rec. Wld Hlth Org.*, 1956, **71**, 29

Causes of Death, and these were applied by the United States Bureau of the Census in a *Manual of Joint Causes of Death*, first published in 1914 and afterwards revised to conform with successive revisions of the List. This manual was used by other countries as well. Rather more flexible rules concerning the cause or causes of death were applied by the General Register Office of England and Wales. The Fifth Decennial Revision Conference requested the United States Government to continue its investigations into the problem of multiple causes of death, in co-operation with other governments and organizations, and these investigations and the suggestions made led in due course to the approval by the Sixth Revision Conference of an International Form of Medical Certificate of Cause of Death and Rules for Classification,[13] which included a definition of the underlying cause of death.

The Rules for Classification observe that, for the purpose of introducing public health measures to prevent the precipitating cause of death from operating, " the most useful single statistic is that relating to the underlying cause of death, which may be defined as (*a*) the disease or injury which initiated the train of morbid events leading directly to death, or (*b*) the circumstances of the accident or violence which produced the fatal injury ". The recommended form provides for :

" I. (*a*) Direct Cause, (due to)
(*b*) Intervening antecedent cause, (due to)
(*c*) Underlying antecedent cause ;

II. Other significant conditions contributing to the death but not related to the disease or conditions causing it."

These Rules for Classification give examples of how the certificate is completed, as well as of improbable sequences in the train of morbid events, and other errors ; and provide notes for the interpretation of entries of causes of death. Member States of WHO pledge themselves under the WHO Nomenclature Regulations to adopt this death certificate, and to ensure as far as possible that it is completed by an attending physican.[14] The Regulations also stress the need for protecting the confidential nature of the certificate during any administrative procedures. This is an important point, and great stress was laid on it in papers read at the First International Conference of National Committees on Vital and Health Statistics in 1954, by Aubenque [15] and Neurdenburg,[16] the latter remarking that if there is no guarantee that confidentiality will be respected, medical practitioners may be reluctant to make a precise and full report.

As already noted, the WHO Centre for Classification for Diseases, after consultation with several national statistical offices and after experimental trials, drew up additional rules—the Supplementary Interpretations and Instructions for Coding Causes of Death, and Medical Certification of Causes of Death—which were incorporated into the Rules for Classification in the 1955 revision of the Manual.

While specifying uniform and efficient methods of recording medical opinion, as given in certificates of causes of death, the 1955 Revision Conference formally recognized the difficulty that many national administrations would have in applying the relevant rules. One serious difficulty in many countries is the lack of medical practitioners to attend the sick and sign certificates. The Conference therefore recommended that WHO undertake a study of methods which could be used temporarily in specific areas as a substitute for the classical methods, but would still furnish health administrations with useful information on the frequency and severity of specific diseases or groups of diseases. A series of regional statistical seminars have since initiated the search for, and the experimental application of, such methods.

[13] World Health Organization (1957) *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death, 1955 revision*, Geneva, vol. 1, p. 355

[14] World Health Organization (1957) *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death, 1955 revision*, Geneva, vol. 1, p. 392

[15] Aubenque, M. J. (1954) *Bull. Wld Hlth Org.*, **11**, 63

[16] Neurdenburg, M. G. (1954) *Bull. Wld Hlth Org.*, **11**, 51

Another important step towards increasing international comparability was taken in April 1955 by the establishment in Caracas, in the Ministry of Health and Welfare, Venezuela, of the Latin American Centre for the Classification of Diseases. The specific tasks of this Centre are to promote completeness, accuracy and comparability of mortality statistics in Latin America, by means of training courses and by serving as the clearing-house for problems arising in the application of the Spanish edition of the *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death*. By a decision of the WHO Regional Committee for South-East Asia in 1958, another Centre with similar objectives is to be established in New Delhi.

Geographical limitations in international comparability

To ensure comparability of health statistics, it is necessary not only to have an efficient administrative machinery for recording vital events, and statistical services to compute and tabulate them, but also an adequate number of competent physicians to diagnose causes of illnesses and deaths. But estimates made by the United Nations Statistical Office [17] show that only 33% of the deaths occurring annually in the world are recorded and included in statistics, the proportion by continent ranging from 100% in Europe and North America to 39% in South America, 18.2% in Asia, and 13% in Africa. The proportion is as low as 8% in tropical and southern Africa, and 7% in eastern Asia. The number of physicians available for certifying causes of death is even less than the number of lay registrars. It is not surprising therefore that the population covered by adequate statistics of causes of death is smaller still than that covered by crude mortality data.

Statistics of cause of death deemed worthy of reproduction in the latest issue of WHO's *Annual Epidemiological and Vital Statistics* cover a population of 682 millions in 50 countries or territories, representing roughly 26% of the world's population.

The practical impossibility of applying standard statistical methods to most underdeveloped areas has been increasingly realized by WHO. The Expert Committee on Health Statistics has accordingly recommended that WHO concentrate its statistical activities in the coming years on the search for substitute methods capable of meeting the needs of territories in various stages of development. The possibility of securing comparable data has been explored at a series of international seminars and training centres in vital and health statistics organized in collaboration with the United Nations. Regional advisers in health statistics have further pursued this task by assisting national goverments.

Co-operation with the United Nations

The definitions of live birth and foetal death adopted by the Third World Health Assembly, as well as the International Classification, have been included in the Principles for a Vital Statistics System, adopted by the United Nations.[18] The United Nations is concerned with problems of demography, and these Principles, after adoption by the Statistical Commission of the United Nations Economic and Social Council, were approved by the Council and forwarded to governments with the request that " they review and appraise their procedures for registering vital events and compiling vital statistics, taking into consideration the principles for a vital statistics system, and introduce such changes as are feasible to improve national statistics and their national comparability in this field... ". The Principles cover the registration of vital events, the recording, reporting and collecting of data for statistical purposes, and the compilation of vital statistics, and were based on a survey of procedures in 58 countries. In their preparation the comments of the WHO Expert Committee on Health Statistics were taken into consideration. As a result, the recommendations relating to

[17] United Nations (1956) *Demographic yearbook 1956*, New York, p. 75.

[18] United Nations (1953) *Principles for a vital statistics system* (*Statistical Papers, Series M*, No. 19), New York.

the responsibility for medical certification of cause of death, the use of the International Form of Medical Certificate of Cause of Death, and the definition and classification of cause of death are in accordance with the WHO Nomenclature Regulations; and the definitions of live birth and foetal death are those given above. There is thus close co-operation between WHO and the United Nations in the effort to introduce uniformity of definition and international comparability into vital and health statistics.

Reports of Expert Groups

Respiratory virus diseases *

Hardly a month goes by without the discovery of a new virus affecting the respiratory tract. Apart from the influenza virus which recently caused a world-wide epidemic, there are many such viruses which are more easily distinguished from one another by serological tests than by the clinical syndromes which they cause. They are responsible not only for acute feverish catarrh of the respiratory tract, but also for eye lesions and intestinal troubles. The differential clinical diagnosis of these virus diseases, whose causal agents can be isolated from the faeces and throat washings, is still very far from precise. A clear-cut etiological relationship between any one of the viruses concerned and a given respiratory syndrome has been established in only a few cases, so that the situation is well described by the phrase "viruses in search of a disease". These viruses are responsible for more or less severe epidemics affecting groups of children or adults—particularly members of the armed forces—in various parts of the world. Usually benign, such infections may nevertheless prove fatal to children or subjects whose resistance is low. They are a cause of morbidity and absenteeism and, as such, important from the public health standpoint.

The discovery of these viruses in increasing numbers, their wide distribution, and the continuing ignorance of their biological properties, degree of variability and the stages in their growth cycle have aroused the interest of microbiologists and extended the field of research on respiratory virus diseases, previously concentrated on influenza. This development is reflected in the fact that the WHO Expert Committee on Influenza has now been replaced by an Expert Committee on Respiratory Virus Diseases. The first report of this Committee [1] has just appeared, and is reviewed in the following pages.

Influenza during 1957-1958

Influenza headed the diseases discussed by the experts. The recent pandemic added greatly to knowledge of the disease and showed up the strengths and weaknesses of the world network of epidemiological information and specialized laboratories co-ordinated by WHO. The epidemiological and clinical characteristics of the pandemic and the probable existence of an animal reservoir, both of which were discussed by the Committee, have already been dealt with in the Chronicle [2].

The antigenic changes occurring in influenza viruses since 1933 (the year when the first of these viruses was isolated) have been

* WHO Expert Committee on Respiratory Virus Diseases (1959) *First report* (*Wld Hlth Org. techn. Rep. Ser.*, No. 170), 59 pages. Price: 3/6, $0.60, or Sw. fr. 2.—. Also published in French and Spanish.

[1] Members of the Committee: Dr C. H. Andrewes, United Kingdom (Chairman); Dr F. M. Davenport, USA; Dr H. Fukumi, Japan; Dr M. R. Hilleman, USA (Rapporteur); Dr I. G. K. Menon, India; Dr J. Mulder, Netherlands; Dr C. H. Stuart-Harris, United Kingdom; Dr A. Svedmyr, Sweden; Professor V. M. Zhdanov, USSR (Vice-Chairman). Secretariat: Dr W. Henle, USA (Consultant); Dr A. M.-M. Payne, WHO (Secretary).

[2] *Chronicle*, 1959, 13, 163.

generally minor, except in 1946-1947, when the A1 virus first appeared, and in 1957, when the A2 virus—differing more sharply from viruses isolated during previous epidemics than the latter viruses differed among themselves—appeared in the Far East. In all probability, this virus will remain the dominant type in coming years. The mechanism of antigenic variation, so evident in the type-A viruses and less appreciable in the group-B viruses, seems to be based on a natural lability, coupled with the forces of selection tending to ensure survival of the virus. It is as though the virus, on encountering an environment which is partially immune following previous epidemics, brings into play hitherto latent potentialities which enable it to survive for a certain period. Thus the A, A1 and A2 types have succeeded one another during the last twenty-five years. They all have a soluble, group-specific antigen in common but have different virus antigens, as shown by the haemagglutination test. These differences are sometimes such that the antibody produced as a response to one virus affords hardly any protection against the others, as in the case of the A1 and A2 viruses.

The variability of the influenza viruses complicates the problem of vaccination. It might be thought that the inclusion of the largest possible number of antigens in the vaccine would ensure reasonably reliable protection. However, the forces of selection seem to thwart these theoretical precautions and the appearance of previously unknown antigens renders them ineffective.

It is part of the role of the World Health Organization Influenza Centres to follow up closely, all over the world, the antigenic evolution of the influenza viruses, which remains a major epidemiological mystery.

Experiments in a number of countries have shown that vaccination has reduced the incidence of the disease by two-thirds. To be effective, it should be carried out at least two weeks before influenza becomes epidemic. The vaccine will naturally contain the virus causing the epidemic, which would be, at present, the A2 virus. It has also been considered advisable to include an A1 strain, for this virus may still be responsible for certain cases. Some workers have suggested broadening the composition of the vaccine still further by including an A strain, a swine influenza strain, a B strain isolated after 1953 and even a Lee 1940 strain. In the light of the experience of the last thirty years, the antigenic make-up of the influenza virus changes to a notable extent only every ten or fifteen years. It is thus probable that vaccines prepared with known strains will confer satisfactory protection during the next few years.

There can be no question of vaccinating the whole population. The cost of this measure would be disproportionate to its practical value. It is clear that certain groups will have priority: those occupying key positions in the general and social services and in branches of industry where mass absenteeism would have serious economic repercussions. In the event of serious epidemics, the age-groups most threatened should also be vaccinated.

Vaccination is recommended furthermore for expectant mothers, and for children and adults suffering from cardiovascular, renal and pulmonary diseases, or diabetes. During the 1957 pandemic, in fact, pneumonia was caused by the influenza virus mainly among persons suffering from chronic pulmonary congestion following a cardiac complaint, or those in an advanced state of pregnancy. Despite its evident pneumotropism, the 1957/1958 virus was relatively mild and caused only a low mortality. It is none the less true that primary pneumonia caused by the influenza virus is of major importance and should be carefully watched for and studied. Cases should be immediately reported to the national influenza centres.

During the last ten years a live influenza vaccine has been administered in the USSR with—its advocates report—results as satisfactory as those given by the formaldehyde-inactivated vaccine used elsewhere. Workers in the USSR have also advocated serotherapy by the intra-nasal route, using hyperimmune horse serum.

No specific treatment for influenza has been discovered in recent years. The Committee

mentioned the serious drawbacks which may accompany the indiscriminate use of antibiotics. Although the latter can save lives in cases of *bacterial* complications—and even in these cases the antibiotics should be selected after identifying the micro-organism responsible—they are not indicated in cases of uncomplicated influenza occurring in persons normally in good health. The dangers of antibiotic resistance which may result from such injudicious treatment must not be minimized.

WHO influenza programme: successes and possibilities for improvement

The abundance of the data brought together and discussed by the Committee is a proof of the value of the epidemiological services and the network of national influenza laboratories operating in liaison with the WHO-sponsored World Influenza Centre and International Influenza Center for the Americas. Despite this the Committee did not conceal the shortcomings observed during the recent epidemic. In certain countries the dispatch of epidemiological information and of virus strains was unduly delayed and sometimes even neglected, despite the realization that the epidemic was spreading on a large scale and that the new virus was responsible. National centres for the study of influenza have not been officially designated in all countries, not because of any lack of laboratories capable of carrying out the necessary work of isolation and identification but owing to lack of organization. Thus, there were regrettable gaps in the network of information and of laboratories in relation with WHO, which, to be effective, must be world wide. The epidemic had in fact already been raging for several weeks before it was reported. This was because it commenced in areas of Asia which do not participate in WHO programmes and do not collaborate with the epidemiological information services. In this way, two months were lost, during which arrangements could have been made to combat the epidemic more effectively than was actually found possible. For, although it is impossible to foresee the origin of an epidemic or what will be its extent and severity, public health measures—if taken in time—can nevertheless limit its effects.

Other respiratory viruses

The discovery in 1953, in an adenoid culture, of certain cytological changes caused by a virus until then unknown, opened up a new chapter in human virology.

This and other viruses of the same family were named " adenoviruses " after the tissue in which the original virus was found. Since their discovery, at least 18 serological types have been isolated. They are found in the respiratory tract, from the nose to the lungs, and also sometimes on the eye or in the intestines. They cause cellular changes in all these parts of the organism, leading to inflammation and hypertrophy of the corresponding lymphatic tissues. Fever, pharyngitis and coughing are the main symptoms, to which may sometimes be added coryza, lymphadenopathy, headache and myalgia. Some of these viruses also cause follicular conjunctivitis and epidemic kerato-conjunctivitis. Their spread is favoured by communal life. They are often found among members of the armed forces in the United States and the United Kingdom, more often in winter than in summer. They are more uncommon among the civil population, but epidemics sometimes arise in child communities. They do not spread through the air only. They may be excreted in stools over long periods and so transmitted as enteric viruses; they have also occasionally been transmitted by water in swimming-pools and lakes.

These viruses form a group with a common soluble antigen. However, they can be distinguished from one another by antigenic factors which can be differentiated by serological tests. They have been given the serial numbers 1, 2, 3, 4, etc. Some types are found more frequently among children, others predominate in military camps.

These viruses grow well only in tissue cultures of human cells, either normal or malignant (HeLa, KB for example). Animal tissues are generally unsuitable for their culture, although adaptation of certain

adenovirus types to monkey-kidney cell culture has been accomplished with difficulty. A considerable time may elapse before recovery of the virus is achieved, since adenoviruses apparently go through a long growth cycle before their presence is revealed by cytopathic changes in the cultures. The report includes technical details on the isolation of these viruses, as well as on serological diagnosis by the complement-fixation and neutralization tests.

Bivalent or trivalent vaccines containing two or three types of adenovirus have been prepared on monkey-kidney cells and treated with formaldehyde. When administered intramuscularly to members of the armed forces, who are particularly liable to infection by adenoviruses, the vaccines led to a decrease of 55-81% in the incidence of acute respiratory illnesses as a whole and of 90% in that of diseases caused specifically by adenoviruses. Vaccination is therefore indicated in barracks and military camps. In 1957 the Federal Register of the United States of America published information on the commercial manufacture of adenovirus vaccine.

A certain number of viruses have been isolated which cause atypical pneumonia and, among children in particular, illnesses sometimes reminiscent of influenza. Examples of such viruses are the Sendai virus of Japan, the CA virus (associated with croup) and the haemadsorption viruses HA 1 and 2.[3]

None of the numerous viruses isolated in recent years can be reasonably regarded as the cause of the common cold, which remains one of the most baffling problems in human virology.

* * *

The report concludes with a series of technical annexes. They deal in particular with methods for the preparation of sera, for the typing of influenza strains, techniques for influenza diagnosis and the use of complement-fixation in the typing of the influenza virus.

[3] Since the meeting of the Committee, the Virus Sub-Committee of the International Nomenclature Committee has suggested the inclusion of these viruses in a *myxovirus para-influenzae* group, of which they would be types 1, 2 and 3, the HA 2 virus being attached to type 1. The use of the term " influenza D " for Sendai virus should be abandoned.

Mental health in old age *

During the nineteenth century, the effects of the Industrial Revolution in increasing wealth and of advanced medical knowledge in reducing the toll of disease were widely felt in western Europe. The birth rate remained high, but the death rate gradually fell, and the net result was a rapid increase in the population. At the beginning of the twentieth century a steep decline in the birth rate set in, and as the death rate continued to fall the relative proportion of the aged began to rise. In some Asian countries the demographic pattern is much the same today as it was in western Europe in the nineteenth century, with a falling death rate and a high birth rate. In parts of Africa and elsewhere, however, the pattern is still one of both high death and high birth rates. As yet no country can be said to have reached an equilibrium of low death and low birth rates, but a number of countries are approaching this position, and others may be expected in time to move towards it. Its characteristic feature is the higher proportion of older age groups in the population.

This increasing preponderance of the aging and aged, at a period in world history of much social and economic unrest, raises many problems in a variety of spheres. Not the least are the mental health problems of aging and the aged, which are discussed in the sixth report of the WHO Expert Committee on Mental Health which has just been published.[1] These problems—the report

* WHO Expert Committee on Mental Health (1959) *Sixth report : Mental health problems of aging and the aged* (*Wld Hlth Org. techn. Rep. Ser.*, No. 171), 51 pages. Price: 3/6, $0.60 or Sw. fr. 2.—. Also published in French and Spanish.

[1] Members of the Committee: Dr E. Braga, Brazil (Rapporteur); Dr A. Querido, Netherlands; Dr A. Repond, Switzerland (Chairman); Dr C. A. Roberts, Canada (Rapporteur); Dr T. Sjögren, Sweden; Dr A. V. Snezhnevsky, USSR. Secretariat: Dr E. E. Krapf, WHO; Dr J. Peterson, WHO; Dr Maria Pfister, WHO (Secretary); Dr M. Roth, United Kingdom (Consultant).

emphasizes—must be studied in their full demographic, epidemiological, social, and medical setting.

This great increase in the number of the elderly and the old is a new situation in the history of the world, and has aroused much speculation and many fears. There is a widespread feeling in highly industrialized nations that the economic burden of looking after the aged will rapidly become more serious as more and more become dependent. In fact, the proportion of dependent individuals is unlikely to undergo any important change, at least for some decades. The view is also widely held that medicine is keeping alive a number of decrepit old people, who have no useful role to play in the community. An inquiry in Sweden, however, reveals that the proportion of invalids in old age has declined progressively in the past three or four decades.

Yet another common belief about the old is that the growing burden they place upon hospital and welfare services has been created principally by the withering away of family affection and the general disintegration of the family group. This has been shown by careful studies in the industrialized countries to be largely untrue. But social and industrial changes lead to movements of the people, and there is a steady drift to the towns (not only in the industrialized, but also in the less developed countries), so that many elderly people are left behind to fend for themselves.

A minority of the aged in the community, never precisely measured, but certainly substantial, suffer from poverty, loneliness, infirmity, and a greater or lesser degree of mental ill-health. In the USA, for example, the figures for first admission to a mental hospital for all forms of mental illness are 2.3 per 100 000 population for under 15 years, 93.0 in the age-group 35-54, but 236.1 for those of 65 years of age and over. In Sweden there are 9000 cases of senile psychosis in a population of some 7 000 000. In most countries with statistics suicide rates reach a peak in old age. Admissions of the old into mental hospitals have also been increasing in recent years, more than proportionately to the increase in the number of the aged. Among the reasons for this are undoubtedly the gradual disappearance of the stigma attached to mental hospitals and the improvement in treatment, but these are not the only reasons. The incidence of senile psychosis has not increased, so it would appear that other factors are concerned, such as the greater attention paid to some forms of mental disorders in old age (for example, the affective psychoses), or the tendency in some countries to admit members of the lower income groups to the mental hospitals in large numbers. An important factor is the deterioration in the conditions favouring the care of the aged in the community.

Statistical data on mental health in old age are lacking in the more developed countries, and, not surprisingly, are practically non-existent in the less developed countries. But, judging from one investigation in Asia, the more serious forms of mental illness in the old are not absent from the less developed countries either.

Causes of mental ill-health in the aged

The factors influencing the appearance of mental ill-health in the aged are manifold. They include economic and social factors: poverty, one of the most striking and universal features of their condition; retirement, often when they are still mentally and physically fit for work, leading frequently to a loss of dignity and status and sometimes to a feeling of being unwanted, of emptiness and utter boredom; and isolation, often a source of great unhappiness. There are psychological and psychopathological factors: maladjustment to life in youth and middle age; the effects of physical, mental and emotional decline. There are physical factors: heredity, metabolic and endocrine deficiency; the effects of nutritional deficiency and infectious disease in childhood; complications arising from diseases first appearing in middle age; infirmity; accidents; cerebral degeneration; disease originating in old age outside the central nervous system. Isolation

in itself is important. In England and Wales, for example, the single, the widowed, and the divorced over 65 years of age take up two-thirds of all general and mental hospital beds.

The promotion of mental health in old age

A reasonable degree of economic security and adequate provision for the care of their general health are essential prerequisites of mental health in the aged. Retirement policies should be revised to allow those capable of work to continue in it, and those not fully capable to have part-time employment. Special employment services would be useful, with carefully developed systems of vocational guidance. The old should have the benefit of legal consultation services to help them with such matters as tax returns. A system of family helpers and of social activities such as clubs would minimize their fear of becoming dependent. The planning of new satellite towns and communities should allow for the preservation, where possible, of the larger family groups. Measures to prevent, or to deal adequately with, chronic respiratory disease, hypertension, and cardiovascular disease, and to provide appliances to increase mobility and reduce sensory defect, would probably help reduce certain mental health problems of later life, and should be co-ordinated by a single authority. Education and preparation for aging should begin at an appropriate time, long before retirement, and before the individual begins to be haunted by fears of old age.

Classification and prognosis of mental disease in old age

Mental diseases in old age are broadly classified by the Committee into affective psychoses, paraphrenias, confusional or delirious states, senile psychosis, arteriosclerotic psychosis, primary pre-senile dementias, secondary pre-senile and senile dementias, alcoholism, and neurosis; and each of these conditions is discussed. Delirious states particularly, but some of the others as well, may be due to physical disease and may be alleviated by treatment; important causes are cardiac failure, acute respiratory infection, operations, dehydration and electrolyte disturbances, anaemias, malignant disease, and vitamin and nutritional deficiencies. Causes often overlooked are the "silent pneumonia" of the aged, slowly developing prostatic obstruction, and pulmonary tuberculosis. Nutritional disturbances are common, the apathy, depression and failing energy of the old often leading them to subsist on a bare, monotonous diet deficient in proteins, vegetables, and fruit. It is of obvious importance to distinguish between what is and what is not due to organic disease.

A relatively high proportion of these mental disorders are curable, as has been shown by recent experience, and, provided medical attention is given early, successful reintegration into the community is obtainable.

Organization of geriatric mental health services

In terms of hospital beds, it would be impracticable to consider the care of even a fraction of the aged who have become mentally infirm or ill. But even if there were an adequate number of beds, it would be far better for the aged to be treated at home; if they must go to hospital for treatment, they should be allowed to return home at the earliest opportunity. There is a growing emphasis on the importance of the social environment as a factor in mental health, a growing realization that uprooting an individual may in the long run hinder his return to the community just as much as illness. The Committee concludes that only by extending facilities for care beyond the bounds of the mental hospital can the health problems of the aged be solved.

An adequate geriatric health service should be so co-ordinated as to be able to assess and investigate all cases from the beginning, to provide them with the necessary social and domiciliary support or hospital treatment, or to place them in the institution best suited to their needs. The form of organization will

vary in different countries, but as a rule the principal health authority will be in the best position to plan and initiate a service of this kind. The heart of this integrated organization should be the "geriatric guidance centre", suitably located, properly staffed, and linked with a general or mental hospital or perhaps a community health centre. The aged themselves, and all concerned with their care, should be free to bring their problems to the centre, and it should be in a position to offer advice on social and legal matters, to inquire into social circumstances, to provide domiciliary services, and to investigate both physical and mental conditions. A system of home visitors, home helps, "meals-on-wheels", transport, clubs and information should be at its call, and it should keep in close touch with voluntary agencies and workers.

A comparatively small geriatric unit with full hospital facilities and no formalities for admission can cater, as has been shown in Amsterdam, for the acute psychiatric and, indeed, geriatric problems of the great majority of old people in a large population. Here the diagnosis can be made, the etiology fully investigated, and most patients treated and returned to active life. But there is also a need for independent geriatric hospitals; existing medical and psychiatric services do not cater fully for the problems and needs of the aged, which have hitherto been unduly neglected by the medical profession. For some elderly persons there should be day hospitals, caring for and treating them during the day but returning them to their relatives at night; for others long-stay hospitals without the full facilities of general hospitals, but providing long-term treatment, nursing care and, particularly, rehabilitation activities; for yet others residential homes, with a minimum of rules and regulations and a genuine home atmosphere; and, finally, mental hospitals for those melancholic patients who are suicidal, or those with paranoid psychoses of relatively long duration, or those with confusional states or dementias with acute excitement. These hospitals all require proper staff and facilities, and there should be provision for follow-up and after-care services, planned in close co-operation with the family doctor.

These services would make a heavy demand on the resources of the community, but this is inevitable if many old persons are not to drag out the rest of their lives in squalor and misery. Apart from their justification on grounds of humanity, they would in any case, if planned in harmony with the modern principle of community care, probably mean a saving in the long run.

Treatment and rehabilitation

Psychotherapy in old age is more important than used to be thought. It should be directed towards the patient's current problems and perplexities, helping him find ways of being useful, supporting him in his search for independence, and encouraging him to expand and strengthen his personal relationships. A high proportion of cases of endogenous depression respond to electro-convulsive therapy (ECT), a form of treatment which may also be of use in some cases of paraphrenia, or occasionally in the depressive reactions of arteriosclerotic psychosis.

Some of the new psychotropic drugs may provide a valuable alternative to ECT for the depressions of old age, and those of the ataractic group, while not affecting the long-term course of arteriosclerotic and senile dementia, do produce systematic improvement and enable many patients with senile decay to live in hostels or even at home rather than in mental hospitals. Particularly in confusional states, a peaceful, stable environment is needed for the patients, and every effort should also be made to provide the opportunity for them to re-establish human contact. Rehabilitation should be planned on the basis of a careful psychological and vocational, as well as psychiatric and physical, assessment of the patient's needs and capabilities. Whatever the form of treatment adopted, close co-operation between the specialities, a domiciliary conference bringing together the family doctor, the psychiatrist, and the social and welfare worker, and full liaison at all points with the family doctor, are of the greatest importance.

A proper geriatric service cannot be envisaged unless doctors and nurses are properly trained, both during their student years and by refresher courses, to deal with the health problems of the aged. No less important is the education of the staff of the public health departments, welfare authorities, residential homes, and voluntary agencies concerned with the aged. The establishment of institutes of gerontology would hasten the advance of knowledge in the field, provide a powerful stimulus to workers in it, and help set a high standard of clinical endeavour and inquiry. WHO could play a great part in facilitating communications between such institutes in different countries, and by organizing international study groups and symposia. Much investigation remains to be done in connexion with the mental health of the aged, however, and the Committee ends its report by outlining what it regards as the important areas of inquiry at the present time.

Biological standardization *

In the twelfth report of the WHO Expert Committee on Biological Standardization,[1] steps are envisaged for making reference preparations of important antibiotic substances available as soon as possible after they have been shown to be clinically safe and effective. The Committee therefore established international reference preparations of neomycin, nystatin, novobiocin and oleandomycin, and considered the establishment of international reference preparations of a number of other antibiotics, including the new antistaphylococcal antibiotics, kanamycin, leucomycin, ristocetin, and vancomycin. It noted that the Second International Standard for Streptomycin has been established. Authorization was given for the establishment of an international reference preparation of human menopausal gonadotrophin and of the urgently needed Third International Standard for Corticotrophin; the Fourth International Standard for Insulin and the Second International Standard for Heparin have now been established.

The Committee considered various reports relating to the establishment of international reference preparations and international standards for vaccines and sera and noted that recommendations had been made for collaborative studies on methods of testing the potency of poliomyelitis and cholera vaccines. A collaborative study of freeze-dried type-specific antipoliomyelitis sera has been completed, and international reference preparations of these sera were established. The International Standard for Syphilitic Human Serum has been established and the International Unit defined. Also, 19 international reference preparations of type-specific anti-Leptospira sera have been made available.

The Committee studied the recommended requirements for manufacturing establishments and control laboratories, for poliomyelitis vaccine, for yellow fever vaccine, and for cholera vaccine, as drafted by several study groups, and agreed that these represented satisfactory formulations of the requirements which should be fulfilled in order to ensure the reliability, safety and potency of important biological preparations.

Continuing former practice, the report is supplemented by an annex listing all international standards and international reference preparations held for distribution at the International Laboratories for Biological Standards in Copenhagen and in London.

* WHO Expert Committee on Biological Standardization (1959) *Twelfth report* (*Wld Hlth Org. techn. Rep. Ser.*, No. 172), 43 pages. Price: 1/9, $0.30, Sw. fr. 1.—. Also available in French and Spanish.

[1] Members of the Committee: Dr M. L. Ahuja, United Kingdom; Dr D. G. Evans, United Kingdom (Rapporteur); Dr P. Krag, Denmark; Professor R. Prigge, Federal Republic of Germany; Dr J. Tomcsik, Switzerland (Vice-Chairman); Dr G. V. Vygodchikov, USSR; Dr H. Welch, USA (Chairman). Representative from the Food and Agriculture Organization: Dr E. C. Hulse, United Kingdom. Secretariat: Dr D. R. Bangham United Kingdom (Consultant); Dr B. K. Bhattacharya, WHO; Dr N. K. Jerne, WHO (Secretary); Dr O. Maaløe, Denmark (Consultant).

With reference to this annex, the report makes clear the distinction between international standards and international reference preparations, the former category containing only those preparations to which an international unit has been assigned on the basis of an international collaborative study.

Notes and News

Viability of BCG vaccine and tuberculin allergy

For practical and economic reasons, it is difficult for workers in BCG laboratories to estimate the efficacy of each batch of BCG vaccine on the basis of post-vaccinal tuberculin reactions. Various methods of testing *in vitro* have therefore been studied; of these, counting the number of viable bacilli in a given quantity of vaccine is at present regarded as one of the most useful.

It is now admitted that the production of both allergy and immunity depends largely upon the viability of the bacilli in the vaccine. Nevertheless, few statistical studies have as yet been published on the possible relationship between the number of viable bacilli and the allergenic potency of the vaccine, and their results have been scarcely significant, owing to lack of uniformity in the experiments and the absence of any satisfactory criterion.

New and strictly controlled experiments have therefore been carried out by a group of Japanese scientists, and the results have just been published in detail in the *Bulletin of the World Health Organization*.[1]

In the first experiment, 28 kinds of dried vaccine were inoculated into 3028 children and the post-vaccination tuberculin reactions were examined after 1, 3-4 and 12 months. The strength of the reactions was assessed in terms of the mean size of the erythema with Old Tuberculin (OT).

In the second experiment, 45 kinds of dried vaccine were inoculated into 1211 children and the tuberculin reactions were examined after 4 and 12 months. The strength of the reactions was assessed in terms of the mean size of the erythema with OT and of the induration with purified tuberculin (PPD).

In both experiments, a definite positive correlation was found between the number of viable units in the vaccine and the size of the post-vaccinal tuberculin reaction. This correlation was always observed up to 12 months after vaccination, i.e., 9 months longer than in previous studies by the same authors.

It is worth noting that the correlation between viability and post-vaccinal reaction holds good for both types of tuberculin employed (OT and PPD) and for both the culture media used for determining the viability of the vaccine (Ogawa and Löwenstein-Jensen). Needless to say, this correlation is subject to certain restrictions. For example, it can be expected only when the degree of bacillary aggregation is similar for each batch of vaccine and when the same strain of BCG is used.

If the borderline of viability is drawn at 10 colonies in 10^{-6} mg of vaccine, the mean size of the tuberculin reaction after 12 months will be 15 mm or more with OT and 13 mm or more with PPD, which is considered evidence of a sufficiently strong tuberculin allergy. When a vaccine contains more than 10 viable units in 10^{-6} mg, tuberculin-positive conversion rates of the order of 90% may be expected.

Recent experiments have shown that glutamate vaccine may be preserved at refrigerator temperature for several years without losing its effectiveness. There is thus sufficient time to carry out culture tests on vaccines before use. If these tests are carried out on each vaccine after it has been subjected to some kind of heat treatment, it will be possible to foretell, to some extent, the

[1] Obayashi, Y. et al. (1959) *Bull. Wld Hlth Org.*, **20**, 1151.

intensity of the tuberculin allergy induced by vaccination.

In the opinion of the authors, this method of determining vaccine potency by counting viable bacilli should be included in the routine laboratory assay of BCG vaccine.

Potency test for poliomyelitis vaccine

The determination of the potency of poliomyelitis vaccines by means of animal tests is a long, difficult and costly process, and not always a reliable one. Increasing attention is therefore being paid to *in vitro* tests for this purpose. The test described by Matilda Benyesh-Melnick & J. L. Melnick in the *Bulletin of the World Health Organization* [1] is an adaptation of a process proposed in 1955 and progressively improved since then.

This test is based on the measurement of the capacity of an inactivated virus in tissue culture to bind neutralizing antibody. The potency of the vaccine is measured *in vitro* by the degree of neutralization of a given quantity of virus, added to a mixture of vaccine and serum which has been incubated for some hours.

The test is type-specific, and the antigen-antibody combination is irreversible. Vaccines containing preservative yield the same potency titres as untreated vaccines. The test gives reproducible results; they do not always agree with those obtained in animal potency tests, which are more subject to variation. Dried vaccines retain their complement-fixing activity, but lose their power to combine with neutralizing antibody *in vitro* and to produce neutralizing antibodies *in vivo*, a finding which suggests that the test measures *in vitro* the antigen responsible for antibody production *in vivo*.

The test would seem to have immediate application in the selection of vaccine lots to be incorporated into the monovalent pools. Rather than pooling lots by chance alone, only vaccines of desired potency could be used, or vaccines of low potency could be pooled only with those of high potency. Another application would be in the periodical testing of vaccines during storage; this would help to determine whether the present date-limit for use (6 months after release) has been properly selected.

[1] *Bull. Wld Hlth Org.*, 1959, **20**, 1075

The Fourth International Standard for Insulin

The Third International Standard for Insulin is now almost exhausted and a Fourth International Standard has accordingly been established to replace it.[2] To meet demands it was decided to prepare a quantity of 1 kg of crystalline insulin, which involved the pooling of contributions from 13 laboratories in 7 countries. The starting material contained 52% bovine and 48% porcine insulin. After the first purifying process, analysis showed the presence of protamine-splitting enzyme, but this was eliminated after further purification.

The final yield was distributed into ampoules, each containing 110-125 mg of crystals. The ampoules were sealed in air, and it is recommended that they should be stored at or below 0°C.

The potency of the substance was established by an international collaborative assay in which 20 laboratories in 8 countries took part. One mg of the substance contains 24.0 International Units. The International Unit is thus defined as the activity contained in 0.04167 mg of the Fourth International Standard preparation.

Health in a border area

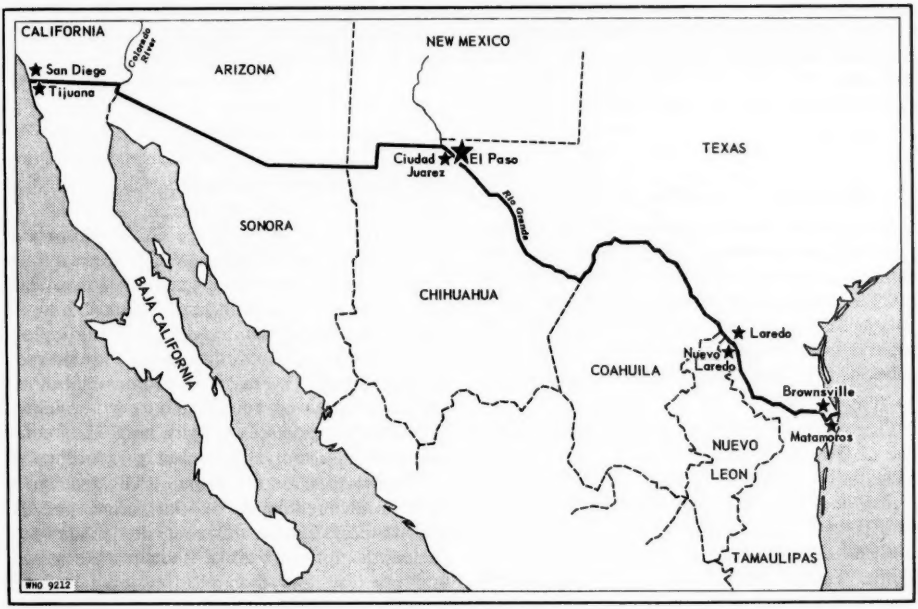
Mexico and the United States face each other across a 2000-mile border. Through its El Paso (Texas) Field Office, the Pan American Sanitary Bureau (PASB), which serves as the WHO Regional Office for the Americas, has succeeded in promoting co-operation between health agencies on both sides of this border.

The El Paso Office was established in 1942 primarily to help the United States and Mexico carry out a practical co-operative programme for the control of venereal diseases. The project was subsequently expanded to include a wider range of health activities.

The basic programme of the Office is: (*a*) to co-ordinate health activities along the border and promote increased contact between health officers of adjacent communities; (*b*) to intensify co-operation in the control of rabies, venereal disease, tuberculosis, malaria, typhus and the rickettsial diseases, and in maternal and child health, public health education, nursing, and

[2] Bangham, D. R. & Mussett, M. V. (1959) *Bull. Wld Hlth Org.*, **20**, 1209

UNITED STATES–MEXICO BORDER



environmental sanitation; (*c*) to stimulate the organization of community health councils in adjacent border towns for the solution of problems of common interest; (*d*) to facilitate exchanges of information on health problems between health officers of adjoining border communities; (*e*) to make available appropriate educational material, including health education literature in Spanish, to border communities; (*f*) to serve as a clearing-house for information on training needs and facilities; and (*g*) to give support to the United States-Mexico Border Public Health Association. The present staff of the Office consists of a medical officer, who is Chief of the Office a rabies adviser, and two clerk-stenographers. Provision has been made for the appointment of an administrative officer in 1959 and a sanitary engineer in 1960.

The Chief of the Field Office at El Paso is also Executive Secretary of the United States-Mexico Border Public Health Association, which is sponsored by public health officials of both countries and partly financed by PASB. The Association holds annual meetings to allow public health workers on both sides of the border to exchange ideas and to correlate their work.

Rabies is a serious problem in the ten Mexican and United States border states, particularly in Texas. In 1958, PASB assigned a veterinary public health consultant to the rabies control programme of the El Paso Field Office. A survey of the rabies situation in the border area and preparations to deal with it have been made. The Office has also supported a predatory animal control demonstration held by the local livestock association in Nuevo Casas Grandes, Chihuahua, Mexico.

Each year a considerable number of Mexican immigrant agricultural workers are rejected at US Immigrant Reception Centres because of tuberculosis. Early in 1958 a meeting between United States and Mexican public health authorities and representatives of PASB discussed tuberculosis control problems, and agreed to establish a form for the intercountry reporting of tuberculosis.

From the beginning, the El Paso Field Office has concentrated on the control of venereal diseases. As a result of its work, these diseases are today a relatively minor problem in the area it serves. The Office is expanding its work to deal with other major public health problems in the area.

Nursing education in Ecuador

Like many other countries, Ecuador needs more and better trained nurses, particularly for work in rural areas. Since 1955, the Pan American Sanitary Bureau (PASB), which acts as the WHO Regional Office for the Americas, has been helping the Government of Ecuador to develop the training of nurses and auxiliary nursing personnel.

There are two schools of nursing in Ecuador, one at Guayaquil on the coast and the other at Quito in the mountains. The hot, humid coastal region does not attract students from the highlands; on the other hand, students from the coast do not take readily to the high altitude of Quito. Taking account of these factors and of the dearth of nurses in the coastal area, it was decided to strengthen the school at Guayaquil. This school which is attached to the Medical Faculty of Guayaquil University was founded in 1929. Yet between 1931 and 1955, it graduated only 64 nurses, as compared with 224 nurses graduated from Quito. Of this total of 288 nurses, 177 were employed in 1955, or only one graduate nurse for every 20 850 inhabitants.

The plan for the improvement and expansion of the Guayaquil School, drawn up with PASB assistance, depends on the co-operation of non-governmental agencies employing nursing personnel. This is a policy now being followed in PASB-assisted nursing programmes throughout the Americas. Until recently, non-governmental organizations and even the professional associations had little influence on the training of nurses, which was exclusively a government concern. The programmes now under way seek to unite both governmental and non-governmental health and medical resources. As a result, associations campaigning against diseases such as cancer and tuberculosis now contribute to the financing of schools of nursing on a quota basis, their contributions being proportionate to their use of professional nurses for their work.

The request to PASB for international assistance in improving nursing education recognized that the number of nursing and medical instructors had to be increased, the curriculum had to be revised and extended, and facilities for practical work had to be developed. In addition the educational requirements for admission needed to be raised.

As part of the plan for the Guayaquil School of Nursing, an experimental three-year programme of instruction is being tried out. The school year has been increased from 32 to 44 weeks, beginning on 1 April and ending on 31 January. Forty-four hours a week are devoted to instruction. The student's responsibilities are gradually increased, and her progress is evaluated periodically and discussed with her. Theoretical and practical courses are closely co-ordinated.

The first year of the course is divided into a four-month preliminary or trial period, and the first clinical period. During the preliminary period, the aptitudes of the students are assessed, and practical and theoretical training in basic nursing is started. The first clinical period includes practice in the care of patients with contagious diseases at hospitals, and in techniques of vaccination at health centres. At the end of the first year, students are assigned in rotation to work in the operating room. Classroom instruction in the physical and biological sciences, the social sciences, and nursing techniques is given throughout the year.

The second year of the course stresses the home and the community, and includes instruction on the growth and development of the child. The year opens with two months' theoretical instruction and supervised practical work in medical and surgical specialities. The rest of the time is devoted to obstetrics and paediatrics, with four weeks' training in public health nursing. Classroom instruction continues as in the first year with the addition of a course in the medical sciences.

The third-year course includes practical experience in urology, cardiology, dermatology, psychiatry and public health, and in ward instruction, supervision and administration. Educational theory is added to the programme of classroom instruction. During the last five weeks, each

student may perform further practical work in a subject chosen in accordance with her interests and abilities. The new curriculum was introduced in 1957, so that the third-year course is now being tried out for the first time.

Teaching of biostatistics in medical schools

The teaching of biostatistics in medical schools was the subject of discussion at a meeting, held in San Luis Potosí, Mexico, from 11 to 15 August 1958, by the Bureau of Experimental Studies in Public Health, Mexican Ministry of Health and Welfare, and the Faculty of Medicine of the Autonomous University of San Luis Potosí, with the collaboration of the School and Institute of Hygiene and Tropical Diseases and of the Pan American Sanitary Bureau, which serves as the WHO Regional Office for the Americas. The report of the meeting, which was attended by professors from medical schools in Guatemala, El Salvador and Mexico, was recently published in pamphlet form by the Bureau of Experimental Studies in Public Health.

The participants, divided into three working groups, discussed the following subjects : the need for statistical instruction in medical schools ; curricula and teaching methods ; and the administration of teaching programmes.

It was concluded that the medical student and the physician need increased statistical training for the correct application of the scientific method, for the critical judgment of quantitative phenomena, and for better understanding of social medicine. The final-year medical student, who in Mexico spends part of his time in medical practice in a rural area, should know how to use the statistical data available on the area in which he serves and how to process and present data obtained personally in the course of his work. The fully qualified physician requires sufficient statistical knowledge to evaluate his own professional activities and the medical literature and to guide him in research.

The minimum content of courses for more advanced students and physicians was outlined. Various methods used in the teaching of elementary statistics, statistical methodology and applied statistics were evaluated ; those requiring active participation by the students, such as practical exercises, discussion groups, team work and field visits, were especially recommended.

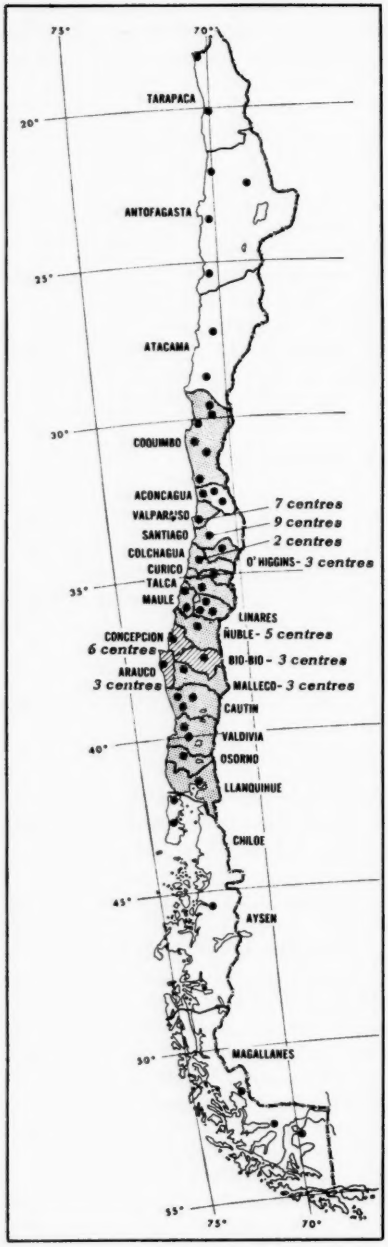
It was also recommended that the teaching of biostatistics be carried out throughout the medical curriculum, both as a separate subject and combined with courses in other subjects such as physiology, pharmacology, bacteriology, pathology, clinical medicine, and legal medicine. The staff should include a full-time medical professor with sufficient statistical training to provide advisory services. Suitable premises for practical exercises, seminars, etc. would be needed, and other requirements include furniture, drawing equipment, slide rules, a calculating machine, and local, regional, national and international bibliographical material. The possibility of using personnel and facilities of hospitals, other health services and the civil registration offices would be a great advantage.

BCG vaccination in Chile

Last year, the mass BCG-vaccination campaign in Chile came to a successful end after two years of activity. The Chilean Government was helped in the campaign by the Pan American Sanitary Organization (now the Pan American Health Organization), which acts as the regional organization of WHO in the Americas, and by UNICEF.

In 1951-1952, an intensive BCG-vaccination campaign was carried out in all Chilean towns of more than 5000 inhabitants; another campaign covered the northern provinces. The 1956-1958 campaign was designed to cover an area extending from the Province of Coquimbo in the north to Llanquihue in the south and including 75% of the country's rural population (see map). The most southerly part of the country was excluded because of its sparse population and transport and communication difficulties.

In 1955, the necessary preliminary information for the campaign was collected, detailed plans were made, personnel were trained and propaganda was started. The staff for the campaign included a Chief Medical Officer in charge of the technical and administrative aspects, a Medical Deputy Chief in charge of the field work, a nurse assigned by the National Health Service, 4 health educators, and 19 vaccination auxiliaries. WHO was asked to supply a nurse educator, who joined the project in April 1956. The actual campaign was preceded by a two-month period



of field work in which all the national staff took part.

The main objects of the campaign were to administer tuberculin tests to 60% of the rural population (from 0 to 30 years of age), to vaccinate negative reactors with BCG, to re-test vaccinated persons and study the pre- and post-vaccination allergies, to instruct doctors and nurses in tuberculin-testing techniques, and, at the end of the campaign, to incorporate these activities in the tuberculosis control programmes of the local health centres.

Before work began in each province, meetings were held at which the aims of the campaign were explained to the local authorities. The four health educators then aroused the interest of the public by talks and film shows.

Tuberculin-testing was carried out in the first three days of each working week, and vaccination in the last three days. The single Mantoux 5-TU tuberculin test was used, and reactions of 5 mm or more were classified as positive. For vaccination, a dose of 0.1 mg of BCG organism in 0.1 ml of diluent was used. All the vaccine was prepared by the Bacteriological Institute of Santiago, one of the laboratories producing BCG vaccine which meets internationally accepted standards of safety and potency. Both tuberculin and vaccine were delivered in dark ampoules and stored in refrigerators. The teams transported the tuberculin and vaccine in ice-filled thermos flasks. To shield the ampoules from the light when in use, they were covered with dark paper cups. Vaccinations were always performed indoors or in shaded arcades.

The re-testing of vaccinated persons was carried out in 10 provinces by the National Health Service nurse, a vaccination auxiliary specially trained for the purpose, and the WHO nurse consultant. The reading of scars and reactions was done by one of the two nurses;

● *Health centres performing BCG vaccinations*

Area included in and covered by the rural BCG campaign between February 1956 and December 1957

Area included in and covered by the campaign between January and March 1958

Area excluded from the rural BCG campaign

the tuberculin test was administered by the vaccination auxiliary. Before the work of re-testing, the two nurses made comparative readings of tuberculin tests in order to equalize their reading methods.

The interval between vaccinations and re-testing varied considerably from one province to another, ranging from 10 to 62 weeks. The Mantoux 5-TU test was also used for re-testing; the stock solution was provided by UNICEF, and the final dilution for use in the Mantoux test was prepared by the Santiago Bacteriological Institute.

Demonstrations of the techniques used in the campaign were given to midwives and nurses at health centres. The nurses also studied the organization of the programme and took great interest in the field work.

During the campaign, approximately 1 031 500 persons were tuberculin-tested; 959 745 tests were read, and 502 852 had negative results. A total of 501 665 persons were vaccinated with BCG.

Despite transport difficulties, particularly during the rainy season, the campaign was completed to schedule, and plans are now being made for the work of testing and vaccination to be carried on by the staff of the health centres.

The mental health of the subnormal child

Formerly, " dullness " among children often passed unnoticed, but it has now come to the fore as a result of compulsory education, the complexities of town life, and the need to learn industrial jobs quickly. Nevertheless, little has yet been done to give the subnormal child the opportunity of developing his potentialities to the full. In school he is often more backward than need be, and later in life he may present serious problems that could have been avoided had he been properly cared for in childhood. A backward child may also create difficulties for his parents and his brothers and sisters; in many cases, the families of such children need help and guidance.

The first European seminar on the mental health of the subnormal child was held in Oslo in 1957, under WHO auspices; it dealt with general aspects of the subject, including the place of subnormal children in modern society and in institutions, problems associated with diagnosis, treatment and training, and social work among the families of subnormal children. A second seminar on the subject, convened by the WHO Regional Office for Europe, was held in Milan, Italy, from 19 to 30 May 1959; it was attended by paediatricians, psychiatrists, psychologists, teachers and social workers from 22 European countries, and its discussions were restricted to consideration of the milder forms of subnormality among children.

Specific topics reviewed by the Milan seminar included: the epidemiology of subnormality, including principles of investigation, prevalence criteria, and types of subnormal children; the value and practice of team work in the treatment of subnormal children with reference to the respective roles of the psychologist, the social worker, the paediatrician, the psychiatrist and the educator; practical principles of case-finding and the organization of preventive and therapeutic services.

Nutrition problems in Africa

The lack of balance in the diets of most African populations and its disastrous effects, particularly on the health of children, have long been a source of concern to a number of international and intergovernmental organizations. The latest in a series of efforts towards a solution of nutrition problems in Africa was a seminar held jointly by the Belgian Government, WHO, FAO, and the Commission for Technical Co-operation in Africa South of the Sahara (CCTA) in Lwiro near Bukavu, Belgian Congo, from 18 to 29 May 1959.

The seminar was intended particularly for persons who had attended the WHO/FAO-sponsored nutrition courses for health workers in Africa held in 1952, 1955 and 1957, and had since carried out nutritional studies in their respective countries and territories. The participants were thus in a position to compare data on the nutritional levels of the various African populations, and to pool experience of nutrition work and research in various parts of the continent in an attempt to solve common problems.

Smallpox survey in the Eastern Mediterranean Region

A survey of antismallpox measures in the Sudan, Saudi Arabia, Ethiopia, Eritrea, the

Yemen, Iraq, Iran, and Pakistan is at present being undertaken by the WHO Regional Office for the Eastern Mediterranean. Some of the countries selected for the survey lie on the main pilgrimage routes of the Region and all are particularly exposed to the hazards of smallpox : for example, between January 1949 and January 1959, 13 810 smallpox cases were recorded in the Sudan, 6052 in Iraq, 5077 in Iran, 2577 in Ethiopia and Eritrea and 956 in Saudi Arabia.

The survey is being carried out by Dr Ahmed Amin Sidky, of the United Arab Republic (Province of Egypt), formerly Director of the Health Services of Alexandria and Cairo, and Mr Paul Ledermann, a Swiss laboratory technician. Dr Sidky and Mr Ledermann are visiting institutes producing smallpox vaccine for the purpose of studying its potency, and are investigating smallpox incidence among populations periodically exposed to the disease. They are also examining the methods used by the public health authorities to check the disease (case-finding and isolation of suspected cases, vaccination campaigns, etc.) and recommending the use and production on the spot of dried smallpox vaccines which are more resistant than ordinary vaccines to the high temperatures prevalent in the Region.

Swimming-pool sanitation

Supervisors of swimming-pools have the responsibility of seeing that bathers are adequately protected against diseases that might be transmitted by the water in the pools. The Philippine Department of Health accordingly held a swimming-pool sanitation course, from 6 to 26 April 1959, for supervisors of pools in Manila and suburbs. The course, which was the first of its kind to be held in the Philippines, was under the technical supervision of Mr Gerard Murphy, a WHO sanitarian.

The course dealt with sanitary requirements for water used for bathing and with the technical problems involved in the proper maintenance of swimming-pools. Practical demonstrations of sanitation techniques and tests were given at pools in various parts of Manila.

People and Places

Hospital statistics in Thailand

The need for making the fullest use of hospital morbidity data is widely recognized. Particularly in countries where knowledge of causes of death is limited by shortage of medical personnel, hospital statistics are a valuable source of information on the health needs of the people and the extent to which they are being met.

A WHO-assisted project to organize hospital statistics in Thailand, to design the records and statistical forms, and to establish a central hospital statistics service will be started shortly. Dr Lowell A. Woodbury, at present statistical consultant at the College of Medicine of the University of Utah, was recently appointed WHO statistician for this project. Dr Woodbury has a Ph.D. degree in statistics from the University of Michigan, Ann Arbor.

Teaching of paediatrics

Dr Gillis Herlitz, of Sweden, has been appointed WHO Visiting Professor of Paediatrics at the Grant Medical College, Bombay, for a period of one year. Dr Herlitz, who was appointed Chief of the Paediatric Clinic in Linköping, Sweden, in 1944, has already worked in India as Senior Officer in Maternal and Child Health with a WHO-assisted project in Madhya Pradesh from 1956 to 1957.

Communicable eye diseases

The WHO/UNICEF-assisted project for the control of trachoma and seasonal epidemic conjunctivitis in Tunisia, which started in November 1953, is expected to come to an end this year. During May, Dr R. d'Haussy paid a second visit to Tunisia, as WHO consultant, to review the progress of the project. Dr d'Haussy is an ophthalmologist with a long experience of tropical medicine, having worked in various African and South-East Asian countries. He was at one time Director of the Institute of Tropical Ophthalmology in Bamako, French West Africa, where he devoted much time to the study of trachoma and ocular onchocerciasis.

Training of sanitary engineers

Dr Ronald T. McLaughlin, of Canada, will take up his duties as WHO Professor of Sanitary Engineering at the University of Bangkok in September 1959. He will advise the Government of Thailand in the development and organization of the Sanitary Engineering Department of the University. Dr McLaughlin, who studied civil engineering at Queen's University, Kingston, Ontario, was Research Fellow in Engineering at the California Institute of Technology prior to his new appointment.

Psychiatric nursing in Iran

With WHO assistance, the Iranian Government is undertaking a long-term programme for the comprehensive nursing care of mental patients and the training of psychiatric nurses. Miss Evelyn Zimmerman, a WHO nurse educator, will assist the Iranian Government in planning and developing the programme. She will also teach psychiatric nursing and the mental health aspects of basic nursing at the Red Lion and Sun School of Nursing, Rey, Teheran.

Miss Zimmerman was educated at Teachers' College, Columbia University, New York, where she was awarded degrees in public health nursing and psychiatric nursing. She has served in senior nursing capacities with the United States Army, and spent four and a half years with the United States International Co-operation Administration (ICA) in Panama, where she trained nurses for administrative and teaching posts in psychiatric nursing.

Regional appointment

Dr Tigani el Mahi, who has been appointed Medical Officer in charge of Mental Health at the WHO Regional Office for the Eastern Mediterranean, is a leading authority on mental health, being particularly well known for his extremely successful reorganization of the mental health services in the Sudan, After receiving his medical degree at the Kitchener School of Medicine in Khartoum, Dr Tigani el Mahi studied psychiatry in the United Kingdom, obtaining the Diploma of Psychological Medicine of the Royal Colleges of London. He is a member of the WHO Advisory Panel on Mental Health and of the Executive Board of the World Federation for Mental Health.

Review of WHO Publications

First Report on the World Health Situation (*Off. Rec. Wld Hlth Org.*, No. 94), Geneva, viii+392 pages. Price: 17/6, $3.25, Sw. fr. 10.—. Also available in French and Spanish.

This volume consists of reports on the health situation of 157 countries and territories throughout the world during the period 1954-56, together with a general survey of salient trends and problems.

The individual reports were prepared by governments as a step towards the fulfilment of WHO's constitutional requirement that each Member State shall report to it annually " on the action taken and progress achieved in improving the health of its people ". They will in turn provide a basis for further action directed towards the particular health problems and requirements of the various countries and territories.

The general survey preceding the country reviews contains much information and comment on significant aspects of the world health situation. Its seven chapters deal with: influences affecting the health of the peoples; the state of the public health; administration of health services and activities; the distribution of functions in the health services; institutions and field establishments; education and training; and future developments.

The facts and figures cited in this survey

and in the country reviews are derived in the main from the period under review, but since the broad lines of the picture thus presented can change only very gradually the observations and suggestions made are of topical interest and are likely to retain much of their validity in the foreseeable future.

Among the many interesting developments described in the general survey is the marked change in the role and scope of the modern health administration—a reflection of the increased awareness, among the nations of the world, of the importance of health not only to the individual, but also as a factor in social and economic progress. The health worker of today is no longer content with lowering death rates; there is increased insistence on improving the quality of human life.

In the chapter on future developments there is a discussion of the general move of public health administration in the direction of co-ordinated planning and the organization of a decentralized system, the effect of new techniques in communicable disease control, rural health development and the continuing difficulties in the supply of medical manpower. For the improvement of living and working environments, most of the technical facts about safe water supplies, the disposal of sewage and the health aspects of housing are already known, so that it should not be difficult to make substantial progress; and in the long run the cost of well-designed environmental schemes will be covered by the economic benefits derived from reduced death and sickness rates. The same chapter deals with other topics of current interest such as community development, health aspects of radiation, and field research and investigation. It concludes with some comments on international collaboration, which is finding fuller expression in many ways, and lays down, as an essential consideration for any advance in health work, " a modest and co-operative approach, for every country has both something to learn and something to teach ".

The country reviews have been grouped according to the WHO regional pattern, which facilitates the comparability and interpretation of the data. In each of them, the section devoted to the health situation is preceded by a brief statement of general background information.

For many of the governments the provision of suitably complete and accurate narratives has been no easy task. Some, lacking more comprehensive data, have been able to supply valuable information from sample surveys; others, however, have not yet been able to produce basic figures. In the successive reports to be published at intervals it is hoped that the country reviews will gradually become more complete.

In this connexion the volume contains, in its introduction and in the general survey, some comments on the various fact-finding techniques available to health administrators. Statistics, essential as they are, require evaluation to be fully effective tools. The pros and cons of special and general surveys are discussed, and emphasis is placed on the value of annual reports written by national directors of health.

The narrative for each region is prefaced by a reference map of the countries and territories concerned, while the general survey includes maps and figures showing climatic regions and density of population, and illustrating the trends of the main quarantinable diseases in recent years.

CORRIGENDA

Vol. 13, No. 3

INTERNATIONAL NON-PROPRIETARY NAMES FOR PHARMACEUTICAL PREPARATIONS

p. 152, tenth name

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p. 157, fourth name

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Vol. 13, No. 5

NEW SPECIES OF MOSQUITO

p. 213, last paragraph, lines 2 and 3

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BULLETIN

DE L'ORGANISATION MONDIALE DE LA SANTÉ

OF THE WORLD HEALTH ORGANIZATION

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Notes

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International Sanitary Conventions and Regulations, plague and relapsing fever

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